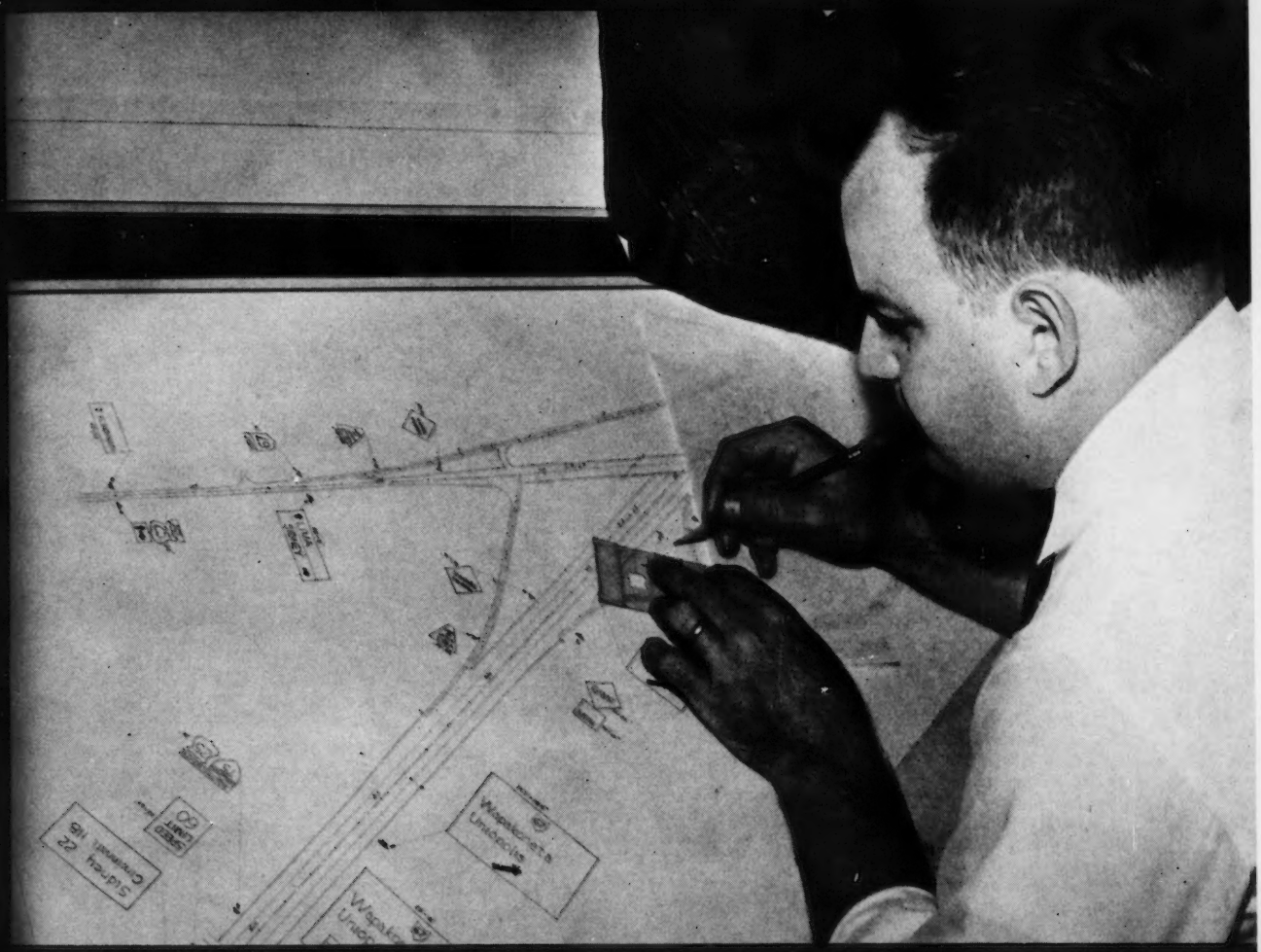
FEBRUARY, 1959

TRAFFIC ENGINEERING



Where is the Money Coming from to Meet Highway Needs?

New Kansas Curve Signs Reduce Deaths

Radio control for Reversible Flows

Accident Experience on Western Jersey Turnpike

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Reflective Pavement Marking . . . what to look for when you buy it

As an engineer, you quite naturally want quality of performance in the pavement marking material you lay down. Yet performance alone cannot be the sole yardstick in evaluating quality because of the cost factor involved. The final selection or recommendation you make, then, actually becomes the result of evaluating all facets of performance in the light of dollar value received.

To help you in this important evaluation, here are a few facts about reflective pavement markings in general, and one product in particular, premixed, "Centerlite" Reflective Compound.

Modern striping unit in Milwaukee, Wisconsin, shows quick, easy one-step application of "Centerlite" Reflective Compound. Reflective beads are pre-mixed in striping compound. Rugged film holds beads in tight grip. Beads give a hard, long-wearing surface to resist traffic wear. You get durability in both reflectivity and in the stripe. You get what you want—performance and economy.

Pre-Mix Durability

Of the two basic types of reflective marking materials, the pre-mix type (where reflective elements are mixed in the compound by the manufacturer) gives you a primary advantage of greater durability. In fact, "Centerlite" Reflective Compound has repeatedly demonstrated its superiority in this department by lasting up to three times longer in actual on-the-pavement tests than other types of reflective markings.

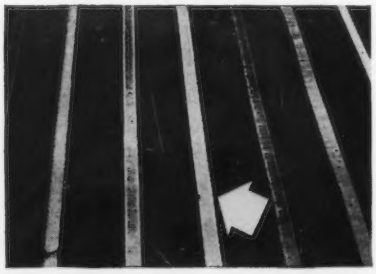
Why the longer life? Because the reflective beads are distributed uniformly throughout the stripe and held in the grip of a rugged film. The characteristics of this film are such that the tightly gripped beads don't flick out easily. Traffic wear is minimized because the film guards and holds the beads in place, and the beads, in turn, provide you with a hard, long-wearing surface.

This durable double-action is an exclusive of pre-mixed striping. Any other reflective stripe type soon loses surface beads to traffic wear, lessening resistance to abrasion and also diminishing its reflective quality as time and traffic pass. The point of durability is a primary advantage of the pre-mix material because it helps give you a *lower* cost per foot per day of useful life. It is certainly one of the things to look for when you buy.

One-step Application Ease

Another significant advantage of pre-mix striping is in application. With "Centerlite" Compound, you have only one item to order, to store, to handle. And because the beads are already in the mixture, you apply the stripe in one fast pass. Humid or windy days pose no problems. The stripe dries quickly . . . and you have reflectivity over every inch of marking, whether on flat or super-elevated planes.

This application ease, too, contributes to lower cost per foot per day of useful life. "Centerlite" Compound can also be easily applied by almost every striper. No settling in the tank, no extra gun wear, no gun clogging.



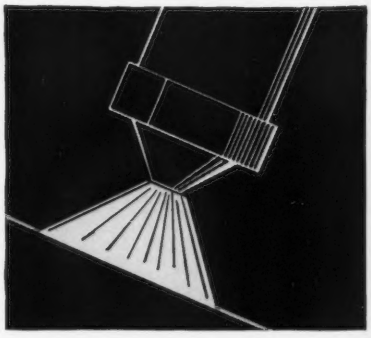
All lines applied on same day. Photo taken after 8-month test proves performance of "Centerlite" Reflective Compound (arrow).

Lifetime Reflectivity

From the safety standpoint, pre-mixed "Centerlite" Compound gives you advantages in lasting brightness that other types of reflective markings can't match.

The reason for this, again, is the fact that the reflective beads are all through the striping compound. So, when your line is laid down, wherever there is paint, there is reflectivity. No chance for spotty, unreflective areas.

As the stripe wears, and they all do, new beads in pre-mixed "Centerlite" Compound are constantly exposed. Reflectivity *lasts the full life of the stripe.* You get, combined with the *lower* cost per foot per day of useful life, the *highest* performance factor. And this is the combination that means you get the performance you look for and the economy you demand.



New "Centerlite" Compound gives you easy, one-step application. Pre-mixed reflectivity stays uniform even on superelevated sections.

Your 3M Distributor or Representative will be happy to supply you with more facts as well as with "Centerlite" Compound itself. Or write to the 3M Company, Dept. GS-29, St. Paul 6, Minnesota.

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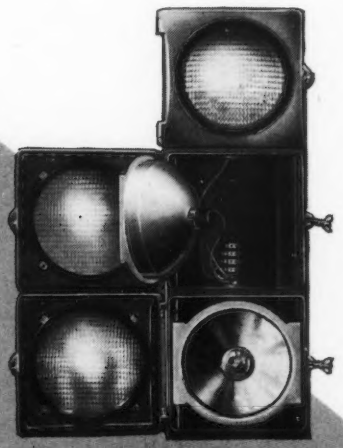

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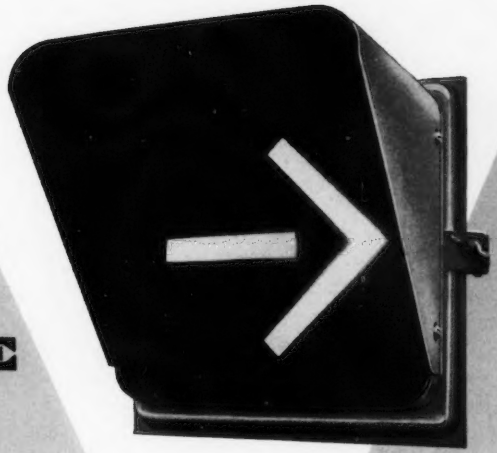

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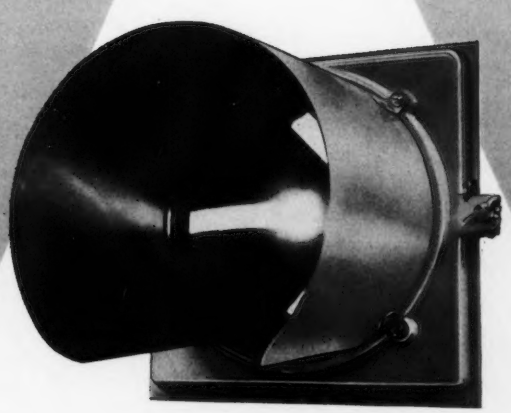

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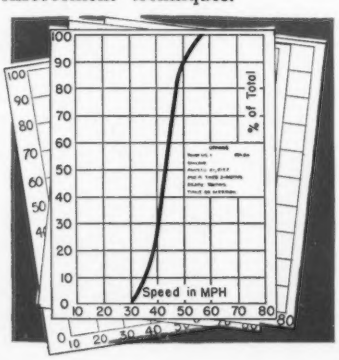

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TRAFFIC ENGINEERING

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Vol. 29 FEBRUARY, 1959 Number 5

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COVER: Signing an interchange on a freeway is as important as the geometrics of the road. This is work on Interstate 75 in Ohio. —Ohio Department of Highways photo.

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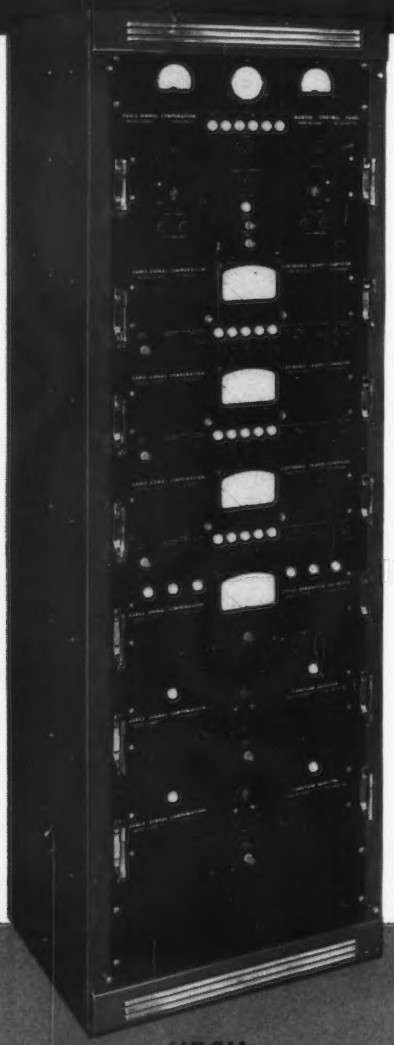

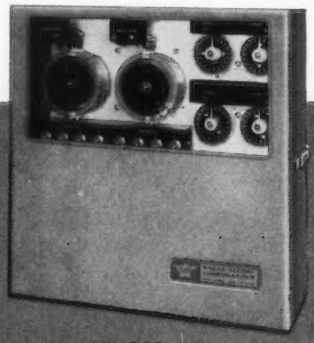

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Frankly Speaking . . .

IN SEVERAL AREAS throughout the country, we are beginning to see the result of the largest public works program in history — the opening of sections of new highways built as part of the Interstate Highway System. This program will provide a tremendous expansion of the use of the principle of controlled access in fulfilling its objective of more adequate roads to handle our growing highway traffic. At the same time, these controlled access facilities, generally called "freeways," present unique operational problems which require new concepts and new techniques to make them function at top efficiency and to meet the needs of the motorist who will use them.

In recognition of these operational problems, the Institute of Traffic Engineers is conducting a series of regional Freeway Operations Seminars throughout the country, with the cooperation of the U. S. Bureau of Public Roads, the American Association of State Highway Officials and other groups. The general objective of these Seminars is to point out the operating problems that prevail before, during, and after construction of these controlled access facilities, and the necessity of making the freeway and the adjacent street system work together to obtain the maximum level of transportation service.

Pursuing this central theme, the discussions during the three-day Seminars include: operational considerations at the planning stage, including consideration of the role of the freeway in the total highway system and its impact on other adjacent facilities; planning for traffic handling during construction; design considerations, taking into account capacity factors, driver behavior, and accident patterns; design and location of interchanges to handle traffic on the freeway as well as to distribute it to the local street system; traffic operations techniques to provide for motorists' needs for food, fuel, rest, information and emergency services; policing needs on freeways; regulation of traffic, including signs and markings as well as laws and ordinances; maintenance problems on freeways, including costs; the impact of the freeway on existing streets and what can be done about it; and finally, a look to the future, suggesting some of the new developments that can be expected in this field.

City, county, state and Federal planners, engineers and police responsible for traffic operation are invited to participate in these Seminars to contribute their knowledge and to exchange ideas with one another. A nucleus of engineers and police experienced in traffic operations serve as discussion leaders, imparting their knowledge and encouraging active participation by those in attendance. The Institute is proud to recognize this "instructor" group, consisting of: O. K. Normann and Donald W. Loutzenheiser, Bureau of Public Roads; Edmund R. Ricker, New Jersey Turnpike Authority; Burton W. Marsh, American Automobile Association; A. F. Malo, Detroit Department of Streets and Traffic; and W. H. Polkinghorn, Detroit Police Department. This group participated in each of the four Seminars held during 1958, and was supported by other experienced persons drawn from the regions in which the Seminars were held.

The full attendance at each of the Seminars held last year indicated an increasing interest and concern on the part of all persons having responsibilities for traffic operations on today's modern multi-lane controlled access freeways. This expression of interest, recognized also by both the Bureau of Public Roads and AASHO, has encouraged the Institute of Traffic Engineers to continue with the Seminar series in 1959. The Automotive Safety Foundation provided a grant of funds to cover the out-of-pocket expenses for the 1958 program and will continue this support during 1959. With this interest and encouragement on the part of supporting groups, the Institute has scheduled seven regional Seminars in 1959.

As these Freeway Operations Seminars are announced in the several regions, we hope the Institute members will continue to support the program by encouraging key technical personnel of city, county, state and Federal organizations who have or will have traffic operations responsibilities on controlled access facilities to attend and participate in the Seminar in their particular area.

EDWARD G. WETZEL
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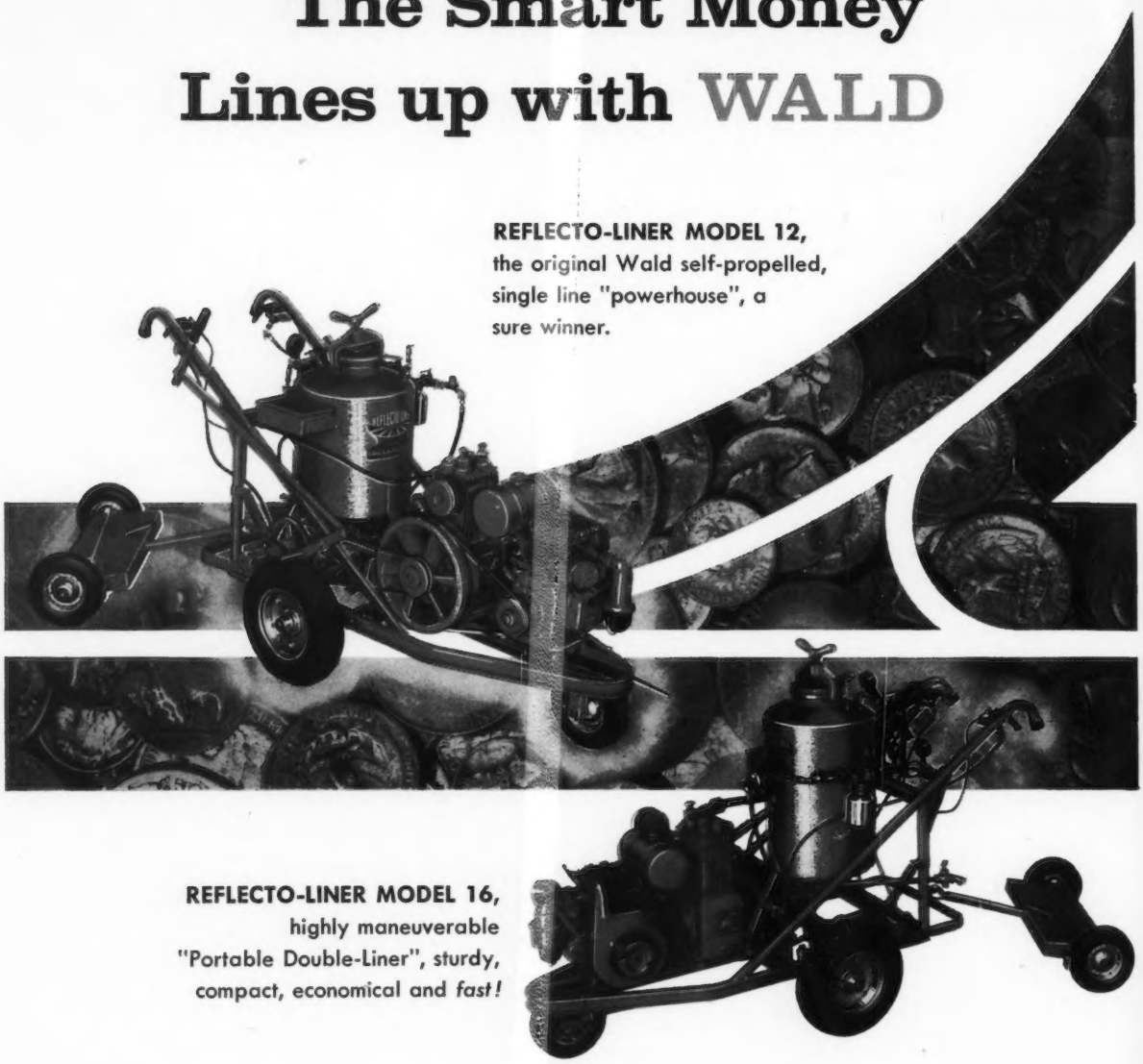

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Where Is the Money Coming from to Meet Highway Needs?

By Pyke Johnson
(Affiliate, ITE)
Consultant, Automotive Safety Foundation
Washington, D.C.

A discussion of some of the *hard choices* which Congress faces as it tackles the dominant highway issue of 1959. Presented before the Washington Section of the Institute of Traffic Engineers at their meeting on January 6, 1959. *Author's note:* Statistics used are drawn from public sources. Their interpretation is a personal one.

PERSPECTIVE is needed to a full understanding of why the chief problem which faces the Federal highway program today is money. Moreover, some background discussion is desirable to disclose the essentially non-partisan attitude which Congress has always taken in highway matters.

In 1955 the Congress had before it the recommendations of the Clay Commission. These were: That the Congress should enact a program involving the construction of 40,000 miles of interstate highways in ten years time with three years of grace for its completion. To pay for it, they recommended a bond issue which should be amortized in 33 years time based on existing gas taxes. Linked with this was a proposal for the creation of a Federal Highway corporation as administrative agency.

The committees accepted the central idea of the necessity for building the roads, but threw out both the bonding idea and the Federal Highway corporation; the first because the idea of heavy interest charges was not acceptable; the second because of a general dislike for the idea of creating any new independent agencies.

The Congress itself over-turned the total idea because the tax increases resulting from a turn to a pay-as-you-go program were held to be inequitable.

In 1956, the Congress extended the construction program to 13 years, put the financing schedule on a 17 year basis, and modified the tax structure. The bill was then passed almost unanimously with the addition of a Federal Trust Fund which was set up as a depository for all those motor vehicle taxes which the Act dedicated to highway purposes.

In setting up this Fund, itself a major change in Federal highway fiscal policies, which up to that time had drawn funds from the general fund of the Treasury, an important last minute change was made.

That change, popularly known as the Byrd Amendment, but having back of it the support of the Treasury, required that all apportionments in any given year for the Interstate system should be limited to the funds which the Secretary of Treasury estimated would be available in the Trust Fund to liquidate contracts arising from such apportionments.

In other words, although the financing provisions of both the Clay Committee and the 1956 Act gave clear evidence that there would be years when existing funds would be inadequate, the Federal program was to be on a strictly pay-as-you-go basis.

This change made no difference in the opening years of the program since while some construction began at once on the new system, the time lag in payments was such as to make existing funds adequate.

The first evidence of a growing pinch in the program came last year when the Congress had to make a decision to reduce the program; to add new taxes; or to suspend the Byrd Amendment.

On the recommendation of the Administration they took the latter course. Since the bill as drafted prior to the Byrd Amendment contained in it a provision authorizing appropriation of funds from the general treasury to be paid back at a later date, plus interest, the congressional action ended there. No new taxes were added.

Pyke Johnson

However, the suspension was limited to the apportionments for fiscal years 1959 and 1960.

Meanwhile, another series of events had a direct bearing on the cost of the program. The estimates submitted by the States in 1958 took cognizance of these facts:

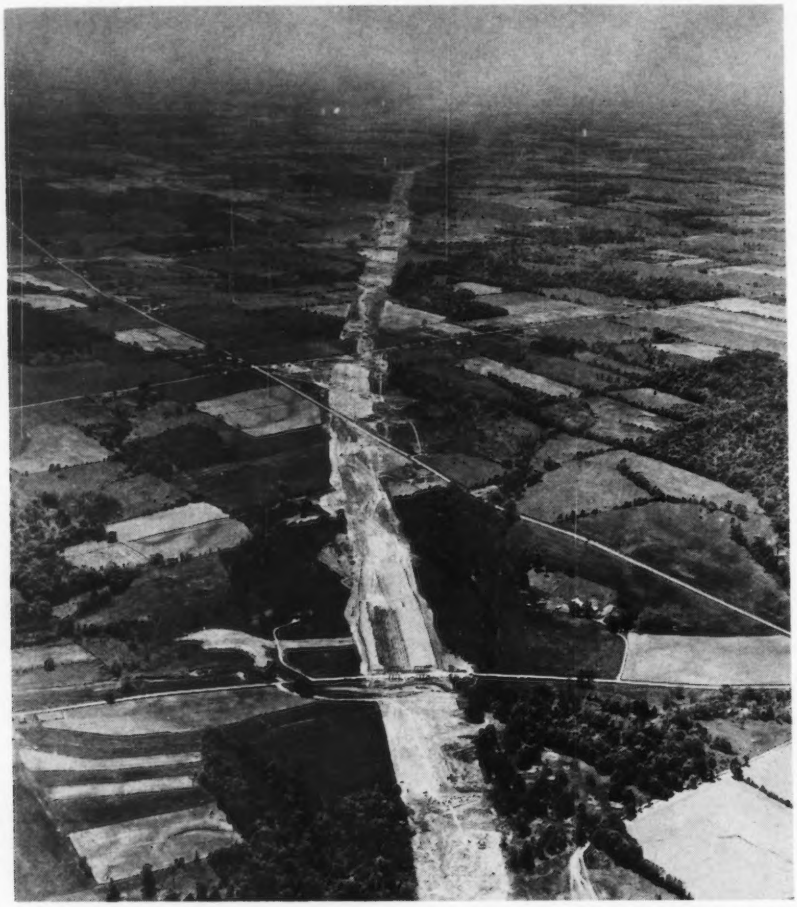
1. An increase of 12 per cent in the general costs of highway work, due to mounting costs in all parts of the economy.

2. An increase in traffic volume of 5 per cent over and beyond earlier estimates.

3. An increase of 3 per cent caused by that section of the act which required reimbursement to utilities on the basis of existing state laws.

4. An increase of 15 per cent due to the change in the local section of the Act which required consideration of local traffic needs where "practicable, suitable and justifiable."

It should be further noted that included in the total costs of the Interstate program but not contained in the 1958 estimates is the 1500 miles needed to bring the total mileage to 40,000 miles which had not been designated when these estimates were



Such scenes as this will become more common as new sections of the Interstate System are started, many of them on new location, as here in Morrow County, Ohio.
—Ohio Department of Highways Photo

made. The cost of these roads is estimated at around $1.5 billion.

So the total Federal costs of the interstate program now come to some $34 billion as against the original $25 billion or around a 37 per cent increase. Parenthetically, while the Congress added still another 1,000 miles to the 40,000 mile system, it specifically stated that funds were not to be provided for those added roads under the terms of this legislation.

Further as an aside, it increased the ABC funds by $25 million and added an emergency work program of $400 million.

Under the 1958 legislation, the Secretary of Commerce went ahead with apportionments for 1960 based on the annual authorizations contained in the Act of 1958. But that is as far as he can go under existing law.

Meanwhile, the construction program has been steadily mounting. The reports of Federal Administrator Tallamy consistently show that the full program of work for both the ABC and Interstate systems has been right on schedule.

The effect has been an increasing withdrawal of funds from the Federal Treasury with the net result that the balance on November 1, was only $811 million. Since expenditures will exceed revenues during 1959 and 1960, it will be necessary under present legislation to draw upon the general funds of the treasury. The law made repayment of these amounts, plus interest, a first call in determining amounts of Interstate funds that may be apportioned for 1961 and subsequent fiscal years.

In cold fact, what this means is that unless the Congress acts at this session, there will be no funds available for interstate apportionment in 1961 and estimated amounts for that purpose in 1962 will approximate $300 million.

In other words, failing congressional action now, all those industries dependent upon the interstate program will find their market gone in 1961 and not fully restored for many years to the level pledged by Congress in 1956.

Too much emphasis cannot be placed upon the immediate and emergent impact upon the national defense, the general economy as well as upon the related industries and, most immediate of all, upon the safety of users of roads if this situation is not met.

Without attempting to go into detail, approximately $4 billion more will be required to provide: (a) for repayment of funds borrowed from the general treasury for work authorized in prior years; and (b) for apportionment of funds already authorized by Congress for the fiscal years 1961 and 1962.

The equally essential ABC program does not now appear to be affected as it has first call on all construction funds in the Trust Fund.

In the public discussions which have taken place up to the present time, there is no evidence that responsible public officials anywhere have any desire to "stretch out" the program.

On the contrary, Senators Gore and Case, as the ranking heads of the Democratic majority and the Republican minority in the Senate, and Congressmen Fallon and Scherer as their opposite numbers in the House, have stated flatly that the program must go forward.

Organized groups of industrial leaders generally, the National Grange, the car and truck user groups and public officials at all levels of government have supported this position.

The problem then comes down, as it usually does, to where the money is to be found to do the job. Here there are sharp differences of opinion since quite generally tthe accepted way of getting things done is to make the other fellow pay for it, if possible.

Up to the present time, the alternative courses appear to be very few.

1. The President has been quoted as favoring an increase of 1 and ½ cents per gallon in the existing Federal taxes of three cents a gallon. This would be sufficient to do the job in present day terms of cost. The reasons cited for this position are generally known. They are keyed to his desire to prevent inflation by balancing the budget.

Against this point of view there has been a widespread and what appears to be an almost unanimous group opposition to any further highway tax increases at this time. The volume of this protest might be discounted some-

Against the background of the Cincinnati skyline, workmen lower a steel rocker shoe into place on piers for an overpass on the Millcreek Expressway — a 16-mile superhighway extending from the Ohio River north.
—Ohio Department of Highways Photo

what if it came alone from immediately affected groups, but there are other elements of serious concern to be considered.

(a) The Congress itself in passing the Highway Act was not sure that the taxes as now levied would prove to be equitable. So it directed the U.S. Bureau of Public Roads to make a broad inquiry into the whole highway tax program and to come back in 1960 with recommendations as to what would constitute a fair and equitable tax base. The task has proved a monumental one and the Congress has now extended the life of that inquiry until 1961.

Clearly, any action taken by Congress now would at least partially foreclose judgments which will be forthcoming next year; might irrevocably close the door to a possible better course of action.

Looking northeast along Interstate Route 70 — paralleling familiar old U.S. 40—in Clark County, southwest of Springfield, Ohio.
—Ohio Department of Highways Photo

(b) Few people fully understand even yet, all the implications of the Federal highway law, particularly its limitations. The fact is that under the existing law, the Federal government only shares in the cost of construction of less than 25 per cent of the total road and street mileage of the United States. True, these generally are the most important roads in volume of traffic but that is true only generally. The constant up-surge of traffic is forcing the development of a large mileage of roads to interstate standards which lie completely outside the pale of the Federal law. Look at any major city in the United States and it will be seen at once that all of them require now many, many miles of streets far beyond existing standards. Yet these roads may be solely the responsibility of states and their sub-divisions.

Remember, too, that all maintenance costs of all roads are paid for by state and local taxes, except for the small mileages of housekeeping roads within Federal lands.

Even before that, there are some 13 states in the country today and there will be many others added in the near future who are finding need for additional funds to carry on their relations with the Federal government.

New York State is only one instant example of this total situation. Virginia is another. Hard-pressed public officials in these and other jurisdictions are already planning to recommend increases to their legislatures this year. Their path will be made much more difficult if at the same time, the Federal government should "up" the gas or other motor vehicle taxes, which traditionally at the state level have gone to highway purposes.

2. A second suggestion which would not require any increase in motor vehicle taxes at this time, is that the Federal government should ear-mark those remaining motor vehicle taxes which it now collects, for the Highway Trust Fund. The amount of these would be sufficient to meet the needed funds. Another way of saying what amounts to the same thing, is that the money should come from the general fund.

On this point, Senator Case, speaking at the San Francisco meeting of the AASHO, said that should this course be taken, he was convinced it would meet with a presidential veto.

The reasons are clear. Motor vehicle taxes would not increase but their withdrawal would have to be met by the application of new taxes in some other field. Realistically there are few who believe that in a Lunik age the existing Federal budget can be trimmed in any substantial way.

3. The third course that presents itself is one that both the Congress and the administration have already subscribed to: the Congress implicitly, by its passage of the existing legislation permitting borrowing from the general fund with repayment later; the President by his endorsement of the original Clay Bill.

This could be either a complete turn to bonding for the financing of the entire program from this time forward which no one seems to be seriously considering; or to an interim operation which thus far appears to have considerable public support. (It should be noted, however, that so far as the speaker knows, no member of the responsible Ways and Means Committee of the House or the Finance Committee of the Senate has yet had anything to say publicly on this or other aspects of the financing problem. Yet it is those bodies which must make these decisions.)

The argument in support of this position may be summed up in this way:

The Congress has already created a precedent by suspending the Byrd Amendment for the first years of the program. Suppose it takes a similar interim action now. The Treasury could then be authorized to issue short term serial revenue bonds or certificates of indebtedness in the name of the Highway Trust Fund as and when required up to a total of $4 billion. As a surety for such obligations, it could then extend the life of existing trust fund taxes from 1972 to such period as it might deem necessary to protect investors.

Under such a procedure, the program could go forward in 1961 and 1962 as pledged by Congress itself; the Bureau study could be completed as a basis for future policies; and the states would not be hindered by further invasion of a field which has been peculiarly theirs except for emergencies until enactment of the 1956 Act. Such action would not increase the debt ceiling.

Against this it can well be argued that bonds cost money and that it is

(Continued on page 34)

New Kansas Curve Signs Reduce Deaths

By Claude W. McCamment
Director of Safety
Kansas Highway Commission, Topeka, Kansas

The author, left, and J. Francis Barclay, highway marking engineer, hold the smaller Curve sign and Advisory Speed sign which have been replaced by the larger, reflective signs mounted on the post. Kansas moved Advisory Speed signs to the top of the Curve to emphasize degree of caution to motorists.

NEW REFLECTIVE SIGNS at turns and curves on Kansas state highways, and "impact" placement at the more dangerous of these locations, have reduced "left-road-at-curve" fatalities by 43 per cent.

This was accomplished in a single year, and in the face of a seven per cent increase in traffic volumes.

A study of the accident records of five years prior to June 1, 1957, showed there had been a 33.6 per cent increase in the number of accidents on Kansas curves; there had been a 20 per cent increase during the same period in the number of fatal accidents on curves.

A careful examination led us to believe that the Curve signs and Advisory Speed signs on many of the turns and curves were not doing their job. The driver was not getting the message which both warned him of the curve ahead and advised him of the safe speed at which to negotiate it. We decided the sign was not attracting the driver's attention, so new specifications were developed for Curve and Advisory Speed signs aimed at one objective: To make the sign find the driver, rather than making the driver look for the sign.

We studied the signs in the field from the driver's viewpoint, both day and night. We experimented with placement, design (within the framework of uniform standards) and other factors in an attempt to tap the driver's consciousness in the brief few seconds he's exposed to the sign.

Advisory Speed Signs

Among the changes in the Advisory Speed signs were color, size and placement.

We changed the background color from Federal Yellow to white. This color separation provided greater attention to the Advisory Speed signs both day and night, helping give it individual prominence equal to that of the Curve signs on which they are mounted. It's possible, too, that this change in color may have had the effect of identifying Advisory Speed signs with the Regulatory signs, thus giving it increased importance in the mind of the driver.

The size of the Advisory Speed signs was increased. The 15-by-15-inch sign was replaced with 18-by-18-inch sign; where we had previously used 18-by-18, we now used 24-by-24-inch signs.

Finally, we learned through experimentation that *mounting the Advisory Speed signs on top of, instead of below,* the Curve signs give them more prominence. The new position puts it out of reach of rapidly growing weeds and underbrush, and equalizes it's attention-getting power with that of the Curve signs.

It is obvious from the attention we give the Advisory Speed sign that it is important in our thinking. We feel that a curve sign alone provides the driver with only half the information he needs. The Curve sign implies action—"caution," or "slow down"—but it makes no reference to the degree of caution or slowing required to negotiate the curve safely. We feel this information is necessary if we expect the driver to maintain control of his car. While in both color and position of this sign we have gone beyond the Uniform Manual, we believe the end justifies the means.

Curve Signs

We made one change in the Turn and Curve signs: The size was increased. With it this rule-of-thumb was established: The size of Advisory Speed signs and Curve signs shall be deter-

mined by the maximum safe driving speed of the curve or turn under consideration.

For example, all curves which have maximum safe driving speeds of 10 to 31 m.p.h. are signed with 36-by-36-inch Curve signs, with 24-by-24-inch Advisory Speed signs mounted above them; those which can be negotiated at 35 to 46 m.p.h. are signed with 30-by-30-inch Curve signs and 18-by-18-inch Advisory Speed signs; all others are signed with 24-by-24-inch Curve signs and 18-by-18-inch Advisory Speed signs.

Maximum safe driving speeds are determined by "running" the turn or curve with a ball-bank indicator. Each is run several times in both directions, because it is possible the maximum safe driving speed will not be the same for both directions on the same curve.

Placement

The only changes in placement called for in the new specifications were at the more hazardous turn or curve locations where we strove for greater "impact." We went further out of our way at these locations to call the driver's attention to the information provided for him on the signs.

At some curves—where safe speeds are less than 35 m.p.h.—we installed a duplicate set of signs on the left side of the road, thus increasing the emphasis for caution on the part of the driver.

Where the curve terminated a long, straight section of the highway, we placed a series of Curve Ahead signs, one in advance of the other, notifying him several times of the differing road pattern he was about to encounter. The series was terminated with a final warning sign indicating the sharpness of the curve by symbol.

Finally, our new specifications called for signing all curves with safe driving speeds up to and including 65 m.p.h. We had previously marked only those with safe driving speeds less than 55 m.p.h.

With the coperation of the division engineers and district supervisors, curves and turns on the entire state highway system were signed according to the new specifications within a short time after they'd been developed.

A year later, we made a comparative study of accidents on turns and curves for the year before and the year after the new signing practices went into effect.

TABLE I

	KILLED	FATAL ACCIDENTS	INJURED	NON-FATAL ACCIDENTS
Year *before* new signing standards	49	43	481	305
Year *after* new signing standards	28	26	468	299

TABLE II

	DARKNESS CONDITIONS		
	DAYLIGHT	DAWN & DUSK	NIGHT
Year *before* new signing standards	11	5	27
Year *after* new signing standards	7	0	19

The results were startling, even to us. We had not expected such a significant decrease—especially in the face of a seven per cent increase in traffic volume. (See Table I.)

Another significant difference involved the number of accidents and fatal accidents which occurred during dusk, dawn and night. Before the new signing standards, 74 per cent of the fatal accidents occurred during these hours of darkness; the new signs and "impact" placements reduced that to 44 per cent, and completely eliminated fatal accidents at dusk and dawn. The fatal accident figures are shown in Table II.

In summary, we learned from our experience what may seem like three truisms:

1. That greater attention to good traffic signing and marking is a most effective, and immediate, method of saving lives and improving traffic flow.

2. That if motorists seemingly pay no attention to traffic signs, it may be an indication of inadequate signing rather than improper driver attitudes. Traffic signs should find the motorist, day and night, rather than the motorist having to look for the signs. The sharp decrease in fatalities and fatal accidents as a result of the new curve and turn signing program in Kansas proved conclusively to us that the motorist will heed the sign's message—if his attention is called to the sign from which he must get the information.

3. That through proper and adequate use of reflectivity, the traffic hazards implicit in darkness can be minimized. The only deference given to the hours of darkness in the entire program was to make sure our signs were completely surfaced with the best quality of reflective sheeting, to be conscious of the need for adequate reflectivity, and to view the situations night and day before and after the new signs were erected. Yet these simple precautions reduced the number of fatal accidents during the dark hours by 30 per cent—completely eliminating dusk and dawn fatal accidents.

A new Kansas Curve sign stands out and "finds the driver" on a dark country road. Brightly visible for long distances, such signs have reduced "left-road-at-curve" fatalities in the state by 43 per cent.

NOTICE

Effective March 1, 1959 the subscription rate for TRAFFIC ENGINEERING magazine is $4.50 a year (foreign postage $1.25 extra).

Increased operating expenses are responsible for this price rise. We wish it were not necessary, but we will point out that it is the first increase since 1949.

—the Editors

Radio Control for Reversible Flow

by William F. Kavanaugh
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City Traffic Engineer, Syracuse, N. Y.
and
Robert C. DeKay
Asst. Traffic Control Sales Manager, Crouse-Hinds Co.

In 1957 the city administration in Syracuse began to evidence grave concern over the rapidly burgeoning vehicle congestion occurring on the city's main east-west artery, Erie Boulevard. This is a 4-lane highway bisecting the city along a route followed by the old Erie Canal, and now serving as the former waterway's dry-land counterpart—carrying the bulk of industrial and passenger traffic passing through Syracuse enroute to points east or west. Traffic counts on Erie Boulevard had been regularly recorded as high as 25,000 cars per 12-hour period (7 A.M. to 7 P.M.).

Conservative estimates by state and local authorities indicated an increased aggravation of the problem. Automobile registrations to Onondaga County had doubled since 1945 to the present total of 154,000. Average yearly increases forecast a swelling of this total to at least 170,000 by 1965.

The immediate problem on the Boulevard required an increase in the number of traffic lanes funneling cars back and forth through the city during peak vehicle movement. Preliminary studies pointed up the fact that maximum congestion occurred as expected from 7 to 9 a.m., and 3 to 6 p.m.—periods when the city is absorbing or discharging its industrial working population. Widening the Boulevard was both physically and financially impractical. The only solution lay in use of a traffic route one block south of the highway to obtain three additional lanes to absorb a share of the Boulevard traffic flow. This alternate but parallel street offered a deceptively simple answer to a traffic question, which if successful, should have application in various areas of Syracuse as well as other cities with comparable traffic bottlenecks.

Syracuse's method involved diverting inbound traffic off the Boulevard onto parallel Water Street (see map) during the peak morning rush. At this time Water Street was made one-way west-bound. In the late afternoon, traffic was reversed coming out of the city; vehicles moved one-way eastbound along Water Street for approximately ¾-mile, gradually curving back into the Boulevard.

The Water Street route included 11 intersections, points at which many motorists could turn off, resulting in a gradual dissipation of traffic volume before re-entering the Boulevard stream. Between the hours of 9 a.m. and 3 p.m., the Water Street route would maintain normal 2-way traffic. In effect 3 additional traffic lanes had been created at peak periods, without disrupting the physical lay out of streets in the immediate area.

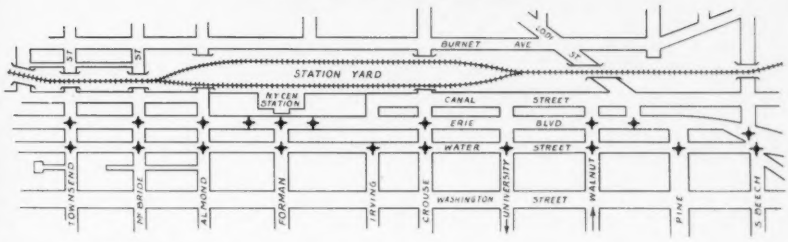
Given this "directional solution," a traffic control system was required which provided reversible flow twice daily, while retaining 2-way traffic during the balance of the day. Previous studies by engineers had established the feasibility of radio control along the 11-intersection Water Street route. Radio could provide an inter-connected, fixed-time system, tied in with the existing control network on Erie Boulevard. Cost studies showed that a multiconductor cable system would have required a prohibitive capital outlay: 1) underground cable meant a cost of more than $54,000; 2) overhead cable connections could bring the cost down to $33,000; 3) radio-coordinated traffic signals required only $28,000. Most important of all, the radio plan provided unlimited potential for interconnected-system expansion in other areas of the city when the need was evident.

Author W. F. Kavanaugh, checks design specifications against recently installed LSM-1 master controller. Complete unit with program switches, pilot lights, panel, etc. is connected to adjacent master tone translator by multi-conductor cable. Coded traffic information is then sent to FM transmitter by telephone line for relay to secondary tone translators at each of 11 intersections.

Radio-controlled intersection tone translator and controller relays information to traffic signal apparatus above intersection on Water Street. Author Robert DeKay (right) shown explaining coordination among various types of intersection equipment.

Water Street intersection, one block south of Erie Boulevard illustrates operation of one and two-way directional neon signs and over-hanging traffic signals . . . all tied into master controller via FM radio.

E. WATER STREET RADIO CO-ORDINATED TRAFFIC CONTROL SYSTEM



Schematic drawing of Erie Boulevard and parallel Water Street in Syracuse. Alternate one-way route has helped to carry burden of boulevard's heavy commercial and passenger traffic.

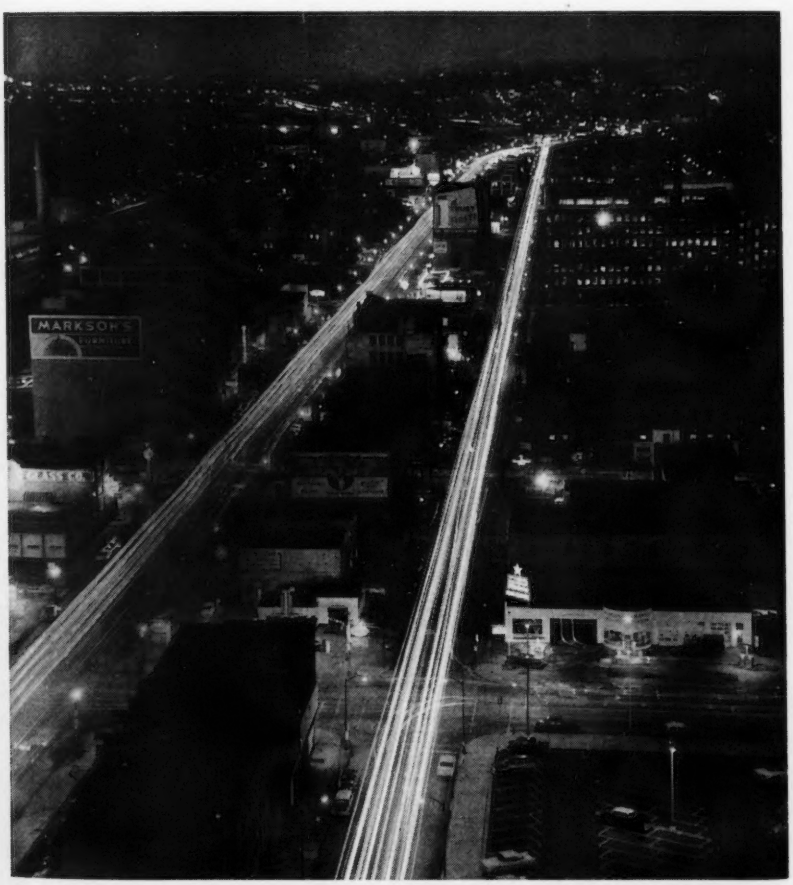
The Water Street by-pass, with 11-intersections, was therefore fitted with a reversible-flow radio-control system operating from a standard Crouse-Hinds LSM-1 master controller situated in the engineering offices of the traffic bureau. Voltage signals from the master controller are fed into an adjacent master tone translator instead of a multi-conductor cable. The master tone translator converts these signals into tone codes which in turn are sent to an FM radio transmitter located on the roof of City Hall. These tones are broadcast on the 450 m.c. band, picked up by a secondard tone translator at each intersection on Water Street, reconverted to voltages and fed into the local controller. Signal lights are then changed according to the pre-determined "program function" at the master controller—in this case, coincident with the pattern used on Erie Boulevard. Results of the Water Street by-pass have shown a substantial reduction in Boulevard traffic as well as a decrease in the number of Boulevard accidents normally attributed to excessive vehicle congestion.

This is a pilot installation for Syracuse that solved a specific local traffic problem; however, as more intersection signal control becomes necessary, we need only locate additional street signals, secondary controllers and intersection tone translators. These units can be removed, reinstalled and/or interchanged at different locations at nominal cost, and coordinated with all existing cable-connected systems with relative offsets between the two groups maintained.

A number of advantages are already apparent in this system. A radio system is easily maintained by the same technicians who service the city police mobile radio system. In interconnected cable systems, cable damage may put the remaining section of the system out of operation. Using an FM radio co-ordinated network, only the one intersection having difficulty will be inoperative. Should there be any interruption of the radio portion of the system, the signals continue to operate on the last function sent by the master controller.

Additional functions such as disaster public address systems, or Civil Defense evacuation routes are easily set up by adding only tones, tone switches, and relays to existing units.

While radio control of signals is not new, having operated for several years in Chicago and Evansville, and more recently in Boston, Los Angeles, and other cities, this application of radio in Syracuse is a "first" as far as is known. A rather vexing traffic control problem has been solved through the use for the first time of a radio-controlled reversible flow traffic system.



Five-fifteen p.m. view, facing east, points up traffic flow on Syracuse's main arterial route (left) and its new reversible-flow companion, Water Street. Time exposure shows traffic relief afforded by various Water Street intersection turn-offs before vehicle flow rejoins main stream of boulevard movement at top of picture.

Accident Experience on The New Jersey Turnpike

By John R. Crosby
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In a routine analysis of an annual accident summary of the New Jersey Turnpike several years ago, it was noted that trucks were involved in what appeared to be a greater share of the accidents than could be justified by their number using this facility or their vehicle miles of exposure. The analysis indicated that passenger vehicles were involved in accidents in about the same ratio to total vehicles involved in accidents as their ratio of passenger vehicle miles of travel was to total miles traveled by all vehicle types. Buses indicated an almost identical relationship to that noted for passenger cars. Truck accident involvement, however, yielded a ratio almost twice as great as that calculated for their vehicle miles of exposure. Preliminary investigations into the accident experience published by other facilities of similar geometric design to that of the Turnpike, gave indications of a similar problem on these roads.

It was realized at the time that there are inherent reasons why trucks may be involved in a proportionately higher share of accidents. Involvement in this sense is not intended to mean responsibility. Some of these reasons are:

(1) The vehicle is more bulky, particularly in length and width, therefore presenting a greater exposure even on a limited access highway to certain types of collisions, e.g. sideswipe and cross median;
(2) Trucks being more bulky are less maneuverable and therefore in some cases may be unable to avoid the potential accident;
(3) Many truck trips are made on a schedule requiring that they be made at night or under unfavorable weather conditions with a resulting increased hazard;
(4) In some states, truck decelerative ability is legally set 50% of that required of passenger vehicles;
(5) Trucks generally have a lower horsepower to gross load ratio and tend to lose speed on grades of even moderate length. This characteristic exposes the vehicle to rear-end type collisions.

Most of these assumed added hazards of truck operation apply to bus operation also, but probably to a somewhat lesser extent.

The findings of the initial study were such as to show a need for a comprehensive study of vehicle types involved in accidents, accident severity and on-the-scene investigation of the more serious accidents. The findings and results of these studies are presented herein.

Accident Study

The accident study covers the six year period from 1952 through 1957. During this period the New Jersey Turnpike carried a total of over 162 million vehicles, accumulating nearly 5.8 billion vehicle miles, and experienced some 6,000 motor vehicle acci-

TABLE I

NEW JERSEY TURNPIKE AUTHORITY
Accident Statistics

	1952	1953	1954	1955	1956	1957	Total 1952 through 1957
Total Accidents	1,007	896	946	1,145	1,009	1,045	6,048
Accidents/100MVM	130.9	102.9	101.8	121.6	94.3	86.6	104.9
Injuries	851	681	533	722	588	793	4,173
Injury Accidents	340	277	233	312	287	385	1,839
Injuries/100MVM	110.6	78.2	57.4	76.7	54.9	66.1	72.4
Fatalities	47	36	23	26	25	24	181
Fatal Accidents	33	26	18	25	18	20	140
Fatalities/100MVM	6.11	4.14	2.47	2.76	2.34	1.99	3.14
Vehicles (Gross)	18,239,527	22,159,034	24,705,851	26,066,256	31,794,142	39,513,604	162,478,464
Vehicle Miles	769,154,204	870,446,013	929,323,931	941,903,600	1,070,272,949	1,206,454,726	5,787,555,423

dents of all types. The accident statistics experienced during each of these years are presented in Table I. The total accidents and accident rates indicated for the years 1952 through 1955 will not agree with those heretofore published, as prior to 1956 the Turnpike Authority followed the State of New Jersey definition which required $100.00 minimum property damage for a reportable property damage motor vehicle accident. In an attempt to standardize its accident system and to obtain conformity with that used by similar agencies, all motor vehicle accidents regardless of dollar value of property damage are included in this table.

Table II is a summary for the six year period of vehicle types using the Turnpike and the vehicle miles traveled by each of these types. These necessarily follow the classification system used in the Turnpike toll charge structure. The classification used for this study is :

Class	Vehicle Types
1	Passenger cars and single-tire trucks
2	Class 1 vehicle hauling a house-trailer or utility trailer
3	Two-axle dual-tire trucks
4	Three-axle trucks or combination
5	Four-axle tractor-trailer or combination
6	Five or more axle tractor-trailer or combination
7	Passenger Bus

For purposes of this study, Classes 3 through 6 will be consolidated under the general heading of trucks and accident summaries will be presented in this way.

TABLE II

Summary of Total Vehicles and Vehicular Miles Accumulated By Each Class During the Study Period

Class	Total Vehicles 1952 Thru 1957	Percentage of Total Vehicles	Vehicle Mileage 1952 thru 1957	Percentage of Total Vehicle Miles
1	142,646,168	87.79	5,109,557,013	88.29
2	390,669	0.24	25,562,346	.44
3	5,495,867	3.38	139,111,485	2.40
4	554,503	.34	22,629,256	.39
5	4,678,962	2.88	145,948,637	2.52
6	5,504,348	3.39	257,600,432	4.45
7	3,207,947	1.98	87,146,254	1.51
Total	162,473,464		5,787,555,423	
Total Classes 3, 4, 5 & 6	16,233,680	9.99	565,289,810	9.76

The vehicle miles traveled is an exact figure computed by the application of the known distances between each interchange of origin or destination. The toll auditing process summarizes common points of access and egress by classes and totalizes the miles accumulated by the classes.

TABLE III

Accident Analysis By Class of Vehicle

Vehicle Class	1952	1953	1954	1955	1956	1957	Total Vehicles By Class
Pass. Cars & 2-Axle Trucks Single Tires	1,705	1,383	1,428	1,742	1,376	1,452	9,086
House & Utility Trailers	22	17	17	13	32	25	126
Trucks 3, 4, 5 & 6	226	229	241	282	343	377	1,698
Buses — 7	15	24	28	24	29	23	143
Total Vehicles By Years	1,968	1,653	1,714	2,061	1,780	1,877	11,053

Table III presents the annual distribution of vehicle class involvement in accidents for each of the study years.

Table IV portrays the Frequency Ratio and Index for each of the four basic vehicle types analyzed. The calculation is based on the data tabulated in Tables II and III. The vehicle miles of exposure for each class has been used rather than the population as this figure is believed to be more representative of the relative hazard experienced by each class. The Frequency Ratios tabulated under column 5 in this table were calculated by the following method:

Frequency Ratio (Class I) = the ratio of the no. of Class I vehicles involved in accidents to the total no. of vehicles involved in accidents divided by the ratio of the vehicle miles traveled by Class I vehicles divided by the total vehicle miles for all classes.

The Frequency Ratio for each of the other classes is calculated in a similar manner by substituting the proper data in the above equation for each of the respective classes. The resulting ratios are rather difficult to compare, so they have been simplified in column 6 under the heading of Frequency Index by dividing each of the ratios by the Class I ratio.

Class 2 vehicles (Utility and House Trailers) have an Index of 2.7. Expressed in other words, these vehicle types were involved in 2.7 times as many accidents as passenger cars based on their relative vehicle miles of exposure. The trailer group has the distinction of being the most unsafe vehicle combination traveling the Turnpike. The magnitude of the problem is, however not very great, as their involvement has only been slightly over 1% of the total vehicles in all accidents.

The Class 7 (Buses) Frequency Index of 0.9 indicates by comparison that as a whole this group is one of the safest on the Turnpike. Furthermore, their exposure based on population is 41% greater than that indicated by their vehicle miles of travel. Much criticism is frequently heaped on this vehicle class on our highways. Official reports note that this class is one of the fastest group of travelers on the highways of America. Yet, this study of nearly 2¼ million bus trips covering over 87 million miles during the six year period points up the lowest in-

TABLE IV

Accident Frequency Index By Vehicle Type

Class	No. of Veh. Involved in Accidents	% of Total Veh. involved in Accidents	Vehicle Mileage	% of Total Vehicle Mileage	Frequency Ratio	Frequency Index
1	9,086	82.20	5,109,557,013	88.29	.93	1.0
2	126	1.14	25,562,346	0.44	2.59	2.8
3						
4	1,698	15.36	565,289,810	9.76	1.57	1.7
5						
6						
7	143	1.30	87,146,254	1.51	.86	0.9
Total	11,053		5,787,555,423			

$$\text{Frequency Index (for each class)} = \frac{\textit{Frequency Ratio (for each class)}}{\textit{Frequency Ratio Class I}}$$

volvement in accidents of any group on the Turnpike.

The Frequency Index of Classes 3, 4, 5 and 6 (Trucks and Truck Combinations) is 1.7. Seventy per cent more trucks are involved in accidents, as compared to passenger cars, than can be accounted for by their respective vehicle miles of exposure. In that trucks represent a substantial share of the vehicle population (nearly 10% in this study), the need for further analysis into the accident types, severity and causation factors appeared necessary.

No. 1

No. 2

Photographs one and two are two views of a passenger vehicle which was involved in a collision with a semi-trailer. The vehicle had been legally stopped on the shoulder of the Turnpike some 3½ feet beyond the edge of the travelled roadway. The semi-trailer departed from the travelled roadway striking the rear of the passenger vehicle. Photograph one best illustrates how the sheet metal portion of the car sustained the major damage without any major impact being absorbed by the bumper and frame of the vehicle. The truck literally rolled over the passenger vehicle. The driver of the truck claimed to have blacked out prior to the accident. The drivers' log indicated discrepancies with the possibility of grossly extended hours of service.

Analysis of Accidents Involving Trucks

The previous analyses were presented on the basis of vehicle types involved in accidents. In order to more fully appreciate the magnitude of the problem, an analysis of all accidents involving one or more trucks was made and is presented in Table V. This tabulation includes a year by year analysis for the six year study period of the types of accidents involving trucks. The annual truck population and exposure mileage are also tabulated by years.

It should be noted that although each of the accidents summarized in this table involved a truck, there is no reason so far as this analysis is concerned to assume that the truck and its operator were responsible for the accidents. The determination of primary cause and responsibility is extremely difficult if it must be done only from the analysis of an accident report.

The tabulated summary for the six year period indicates that truck traffic accounted for 10.0% of the vehicles using the Turnpike and 9.8% of the vehicle miles. While accumulating these modest exposure figures, they were involved in 24.9% of all accidents, 25.2% of injury accidents and 39.3% of the fatal accidents. Furthermore, these accidents resulted in 24.8% of the total injuries and 43.6% of the fatalities that occurred on the Turnpike during this six year period. The last two statistics are interesting in that they may give some explanation as to why the injury and fatality rates frequently attained by parkways are below those on comparable facilities carrying mixed traffic.

The high fatal accident involvement statistic indicates a necessity for analysis of accident types involving trucks that resulted in a fatality. Table VI summarizes the accident types for all fatal accidents during the study period involving a truck. Rear-end collisions with trucks account for 65.5% of these fatal accidents. Of this percentage, 75% resulted from a vehicle striking the rear of a truck, and the remainder involved a truck striking another vehicle type. Seventy-five per cent of the rear-end fatal collisions occurred during the hours of darkness. The tabulation leaves little doubt that the rear-end truck accident is a serious problem on a limited access highway such as the Turnpike. The severity of the truck accident is also greater, averaging 1.4 fatalities per accident compared to 1.2 for fatal accidents not involving a truck.

Engineering Accident Investigation

Since 1954 the Traffic Engineering Department of the New Jersey Turnpike has adopted the policy of departmental investigation at the scene of serious truck accidents and all fatal accidents whenever possible. As the Assistant Traffic Engineer in this Department, the author has been an investigator at the scene of many of these accidents. This decision to make on-the-spot investigations on 24-hour call was found necessary due to the lack of information on those important small items surrounding every accident that might have reduced its severity or eliminated the occurrence altogether.

These continuing investigations into the basic causes of the high involvement and severity of truck accidents may be summarized as follows:

(1) Inadequate and/or poor maintenance of rear lighting equipment, e.g. tail, stop, clearance and turn signals. Of these four distinct varieties of lights, the clearance and tail lights are universally the poorest. These units are also the most important from the standpoint of safe operation on limited access highways. A tail light legally may be below 3.0 candlepower. In tests made of these truck lights on the Turnpike, over 88.5 per cent were below this figure. By comparison, stop lights and turn signals to be legally acceptable under current standards must be

TABLE V

Truck Accident Experience on the New Jersey Turnpike

	1952	1953	1954	1955	1956	1957	1952-57
All Accidents	1,007	896	946	1,145	1,009	1,045	6,048
Acc. involving Trucks	199	217	219	276	302	295	1,508
% Acc. involving Trucks	19.8	24.2	23.2	24.1	29.9	28.2	24.9
All Fatal Accidents	33	26	18	25	18	20	140
Fatal Acc. involving Trucks	16	10	7	7	5	10	55
% Fatal Acc. involving Trucks	48.5	38.5	38.9	28.0	27.8	50.0	39.3
All Fatalities	47	36	23	26	25	24	181
Fatalities involving Trucks	28	15	9	7	7	13	79
% Fatalities involving Trucks	59.6	41.7	39.1	26.9	28.0	54.2	43.6
All Injury Accidents	340	277	238	312	287	385	1,839
Injury Acc. involving Trucks	74	65	58	77	82	107	463
% Injury Acc. involving Trucks	21.8	23.5	24.4	24.7	28.6	27.8	25.2
All Injuries	851	681	533	722	588	798	4,173
Injuries involving Trucks	223	157	159	136	160	198	1,033
% Injuries involving Trucks	26.2	23.1	29.9	18.8	27.2	24.8	24.8
All Rear-end Accidents	415	418	469	529	444	530	2,805
Rear-end Acc. involving Trucks	150	118	122	146	140	170	846
% Rear-end Acc. involving Trucks	36.1	28.2	26.0	27.6	31.5	32.1	30.2
No. Vehicles involved in Acc.	1,968	1,653	1,714	2,061	1,780	1,877	11,053
No. Trucks involved in Acc.	226	229	241	282	343	377	1,698
Total Vehicle Miles	769,154,204	870,446,013	929,323,931	941,903,600	1,070,272,949	1,206,454,726	5,787,555,423
Truck Vehicle Miles	62,487,478	82,995,187	91,527,115	94,180,580	106,247,947	127,851,503	565,289,810
Truck % of Total	8.1	9.5	9.8	10.0	9.9	10.6	9.8
Total Vehicles	18,239,527	22,159,084	27,705,851	26,066,256	31,794,142	39,513,604	162,478,464
Total Trucks	1,406,726	2,102,558	2,410,185	2,796,477	3,290,908	4,226,826	16,233,680
Truck % of Total	7.7	9.5	9.8	10.7	10.4	10.7	10.0

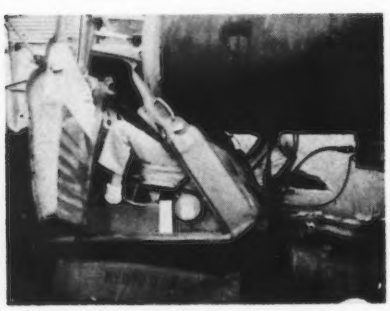
TABLE VI

Analysis of Fatal Accidents Involving Trucks

Total all Fatal Accidents 1952 through 1957	140
Total Fatal Accidents Involving Trucks 1952 through 1957	55
Total Fatalities Involving Trucks 1952 through 1957	79

Collision Type	Number	% of Total
Rear-End Collisions		
Truck struck rear of vehicle other than a truck	4	7.3
Vehicle struck rear of moving truck	14	25.5
Truck struck rear of vehicle other than a truck that was stopping, parked or starting	5	9.1
Vehicle struck rear of truck stopping, parked or starting	13	23.6
Head-on Collisions		
Truck crossed median	2	3.6
Other vehicle crossed median	5	9.1
Out-of-Control		
Fixed Object	1	1.8
Overturned or left roadway	4	7.3
Miscellaneous (Includes pedestrian, sideswipe, etc.)	7	12.7
	55	

30 and 100 candlepower respectively. Other tests made on passenger vehicle tail lights indicate readings averaging in the range of 10 to 20 candlepower. There are still a significantly large number of trucks displaying legal tail lights of only one-quarter candlepower.



No. 3

No. 4

Photograph three illustrates the result of a flat bed semi-trailer involved in a rear end collision with another semi-trailer which was unable to attain a speed in excess of 30 miles per hour after having entered the Turnpike two miles previous to the point of impact. The collision impact was moderate and in itself need not have necessarily resulted in a fatality. Photograph four pictures an identical combination and shows the lack of a protective back board as required by the Interstate Commerce Commission regulations to protect the driver from a shifting load.

(2) Lack of suitable rearward warning equipment for identification of stopped or slow-moving trucks. The Uniform Vehicle Code under Section 12-220 (d) recognizes the need for a separate and distinct warning signal for this purpose. The approved signal would display two simultaneously flashing amber or red lights mounted on the rear of a vehicle and spaced laterally as close as practical to the edges of the vehicle. The need for universal use of this signal is very important to safety on high-speed highways. A stopped or slow-moving vehicle is a far greater hazard than one moving at normal speed. Yet, under present standards the tail light delineates each inadequately.

(3) Lack of adequate front and rear bumpers of such design as to mate with those used on other vehicle types. Many of the serious rear-end type accidents involving a truck might have been a relatively minor accident if there had been adequate protection on the front and rear of the truck. The dimensional differences between a car and truck are great. In rear-end collisions involving those two vehicle types, the truck either rolls over the rear of the car or the car slides under the rear of the truck. In either case the passenger compartment sustains the major damage resulting in serious injury or death. If the same impact were directed at the structural members of the car, the absorption of energy by these members would minimize the damage to the passenger compartment and the passengers.

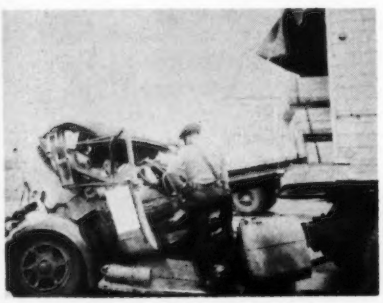
(6) Lack of control and enforcement over driver hours of service has been a serious contributing factor to truck accident involvement. In the investigation of many of the truck accidents, extended and illegal tours of duty were discovered. The drivers upon questioning about details of the accident were frequently unable to supply any information other than they blacked out or might have fallen asleep. It is interesting that the problem is not confined to night time hours and it is not uncommon to occur during periods of heavy traffic movement when the maximum in driving skill is required of each driver.

(5) Poor operating characteristics of the motor truck, e.g. inability to accelerate to normal highway speeds within reasonable distances and poor performance on even relatively flat grades. Many of the serious accidents investigated involved a truck as the forward vehicle which was traveling at a speed substantially below the speed limit. In many of these cases, the speed of travel was not that chosen by the driver as a desirable speed, but was the result of the physical limitation of the truck and the load carried. (Maximum gradiant on the Turnpike is 3% and occurs only at several locations in its 131-mile length).

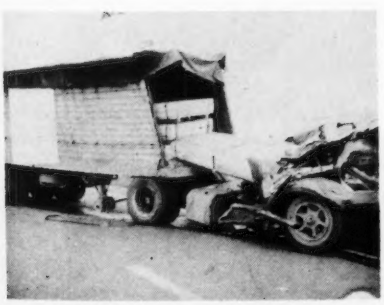
The lack of accelerative ability has further complications in addition to the safety aspects. This is their adverse effect on highway capacity, particularly on grades. Thus, any major increases in truck performance would yield a two-fold advantage. Until such gains may evolve, driver education may aid in partially overcoming the mechanical deficiency. Many of the severe accidents included in this study were the result of a slow-moving vehicle pulling onto the traveled roadway. This movement was made even though a broad paved shoulder was available for accelerative purposes. There would appear to be little appreciation on the part of the driving public to the hazard involved in this seemingly innocent act. On a limited access highway with their usually higher operating speeds the maneuver can be fatal.

Another plausible method of improving the operating characteristics of these vehicles would be to set the maximum permissible load by the available brake horsepower. With a more favorable balance between these known quantities, the acceleration characteristic and ability to maintain a higher speed on grades could be greatly improved.

(6) Improper loading and inadequate safety devices to protect the truck driver from a shifting load has been the primary cause for a number of fatalities included in this study. Some of the rear-end accidents investigated involving a truck as the rear vehicle would have been a relatively minor collision except for the shifting of the load which crushed the occupants of the truck cab. In every case that can be recalled involving damage of this type, the truck did not comply with the Interstate Commerce Commission requirements for securing of the load or a substantial backboard between the load and driver compartment. There are still many trucks on the road which provide little, if any, protection for the driver against this type of damage.



No. 5



No. 6

Photographs five and six are two views of a semi-trailer transporting an improperly secured load of flat aluminum sheets. This vehicle struck a truck which was starting up from a stop. From photograph six it will be noted that the front end damage as a result of the collision was quite moderate. The result, of course, was the catapulting of the stacks of aluminum sheeting from the trailer which completely demolished the cab of the tractor.

Summary and Conclusions

The analysis of six years of accident experience on the New Jersey Turnpike is summarized in the following statements:

(1) The safety record of the New Jersey Turnpike is excellent compared to the national average. The total accident and injury accident rates are but a fraction of the national statistics and the cumulative fatality rate is less than one-half of the national rate. Even with such a favorable record, the Authority is desirous of improving safety on the Turnpike. Many of the advances in highway safety cannot be accomplished by a roadway operating agency, but depend on national and individual cooperation regarding all items concerning the driver, vehicle and safety equipment.

(2) Passenger vehicles and buses have the lowest relative involvement by vehicle type in motor vehicle accidents. The former group, however, is involved in the greatest share of vehicular accidents.

(3) Buses have had a very favorable accident involvement ratio, below that of any other vehicle type traveling the Turnpike.

(4) Class 1 vehicles towing house or utility trailers have the poorest involvement ratio. The instability of this vehicle combination combined with driver unfamiliarity with the difficulties in handling the combination is probably the primary reason for this high involvement in accidents.

On the Turnpike, house trailers are not permitted entry if they exceed the 8-foot maximum width and 50-foot overall length regulations. Furthermore, during periods of gusty winds or other unfavorable weather conditions they are banned from entry to the highway. Even with these stringent controls, they have attained an unenviable accident involvement record.

There is an apparent need for further study of their accident problem. Motor vehicle officials and legislators should also be critical of demands by promoters of these vehicle types for liberalization of the maximum size regulations which may tend to increase their instability.

(5) The study indicates a high involvement of trucks in accidents. On the basis of vehicle miles of exposure, they experienced a 70% higher involvement than passenger vehicles. For the six year study period, trucks were involved in 24.9% of all accidents, 25.2% of the injury accidents and 39.3% of the fatal accidents which resulted in 24.8% of the injuries and 43.6% of the fatalities. Their exposure on the basis of vehicle population and vehicle mileage was under 10% of the total exposure for all vehicle types.

(6) The analysis of the accident records used in this study as well as the personal accident investigations made by the Turnpike Traffic Engineering Department, at no time gave any indication that a differential truck speed limit was necessary or even desirable from the standpoint of improved safety or operation. This type regulation combats only the problem of less effective truck brakes. In accomplishing this it penalizes the truck on level tangents, and even more so in areas involving grades, resulting in a greater susceptibility to rear-end accidents which is their major accident problem on the Turnpike.

(7) An appreciable improvement in highway safety and reduction in accident severity could be achieved on the Turnpike by:

a. Improved rear lighting on trucks.
b. The universal adoption of the recommended standard rearward warning devices delineating a very slow moving or stopped vehicle.
c. Adequate bumper designs on the front and rear of trucks.
d. Better regulation and control over driver hours of service.
e. Improved truck performance, particularly its accelerative ability.

The cost of real progress on the first three items is relatively insignificant and might possibly be completely offset by the savings that could be realized by lower insurance costs, less lost time, and damaged equipment and cargos.

(8) The accident experience gained on the Turnpike should closely parallel the future experience on the 41,000 mile Inter-state system. Any reductions in accidents, injuries and fatalities that can today be achieved on the Turnpike by such methods as:

a. Improved operating procedure
b. Safer vehicles and equipment
c. Improved highway design

will aid greatly in the reduction of the accident tolls yet to be experienced.

(Continued on page 34)

Traffic News

Police Urge Joint Action On Speed Limits, Freeway Design

The International Association of Chiefs of Police recently approved two resolutions of interest to the Institute of Traffic Engineers and to the engineering profession in general. Both of these resolutions indicate a desire on the part of traffic police to share with the traffic engineer and others the responsibility for traffic operations on streets and highways. Two areas were specifically mentioned—the setting of speed limits and the design and construction of freeways, particularly insofar as policing requirements are concerned. The first resolution was as follows:

> "That the International Association of Chiefs of Police communicate with the Institute of Traffic Engineers and the American Association of State Highway Officials and request that traffic engineers consult with the involved enforcement agencies before recommending or establishing speed limits, including zoned speed limits."

The second resolution was as follows:

> "Whereas local conditions and political subdivisions require various different approaches to the policing of limited access highways, the Traffic Committee of the International Association of Chiefs of Police earnestly recommends that all parties responsible for the planning, design, and construction of these highways contact and counsel with the local and state law enforcement agency when construction of such highways is first contemplated."

In addition, the IACP Traffic Committee proposed a list of items on which they felt law enforcement agencies should be consulted by those responsible for the planning, design, and construction of highways when such highways are first contemplated:

1. The planning for the location of weighing and inspection stations for commercial vehicles.

2. The location of police facilities such as stations, radio installations, and other facilities necessary for efficient police operations.

3. Turnarounds or crossovers to be utilized by police, maintenance, and other emergency vehicles.

4. Installation of a public communications system, such as telephone call boxes, at intervals along the highway.

5. Establishment of emergency parking areas for disabled vehicles and rest areas for fatigued drivers.

6. Parking limitations or restrictions properly signed.

7. Zoning and signing of completed rotes with adequate mileage markers of sufficient size to enable motorists to identify location if disabled and to facilitate emergency services.

8. Sufficient illumination at strategic areas such as interchanges, service areas, and state lines.

9. Reduction or elimination of left side entry ramps and also of left side exit ramps to reduce lane changing.

10. The elimination of sharp curves in exit ramps.

11. Adequate acceleration and deceleration lanes of sufficient length. (500 feet minimum.)

12. Better standards for the allotment and spacing of access ramps.

13. Estimates of potential traffic flow so that strained capacities will not require reduction of operating speeds.

14. Elimination or minimization of grades in excess of two per cent and provision of truck-passing or slow traffic lanes on grades where truck traffic is appreciable.

15. Anticipation of obstructions such as traffic signals at the end of off or exit ramps.

16. Elimination of obstructions to driver vision at areas of merging traffic and provision of full visibility on horizontal and vertical curves.

17. Engineering of off and on ramps so that the minimum speed of traffic will not drop below 35 mph.

18. Planning so that a reduction in the number of traffic lanes does not occur without a conditioning distance.

19. Provision of adequate signing or other identification of all right-hand lanes as those to be used by slow-moving traffic.

20. Sufficient warning, regulatory, and directional signing, with notification to the police when these signs are erected or changes made thereto.

21. The design of the highways to provide adequate width of traffic lanes and wide stabilized shoulders.

22. Provision of physical barriers separating opposing lanes of traffic.

23. Provision for surveillance points for police personnel.

24. Provision of crash gates or access points to the highway for police and other emergency equipment.

Freeway Operations Seminars Scheduled for Chicago, Omaha in April

Freeway Operations Seminars have been scheduled for the Chicago area and the Missouri Valley area in April, according to the Institute of Traffic Engineers.

The Chicago Seminar will be held April 15 to 17 at the Moraine Hotel in Highland Park, Illinois; and the Missouri Valley Seminar will be held April 20 to 22 at the Town House Motel in Omaha, Nebraska.

Attendance at the Chicago meeting will be drawn principally from Illinois, Indiana, Wisconsin and Minnesota. The Omaha meeting will attract participants from Iowa, Nebraska, Kansas, Missouri, the Dakotas, and possibly Colorado.

These seminars will be the seventh and eighth in a series started in 1958. All of the meetings, which are sponsored by the Institute of Traffic Engineers, are designed to acquaint engineers, planners and enforcement officials with the problems connected with the operation of controlled access facilities such as will be built in the Interstate Highway program.

Invitations will be extended to traffic engineers, planners, design engineers, enforcement supervisors and other city, county and state officials who will have responsibilities in planning or operating a freeway or expressway.

Discussions will be led by a team of engineers and police officers who have had experience with this type of highway.

Local arrangements for the Chicago Seminar are in the hands of a committee headed by George F. Hagenauer, representing the Midwest Section of the ITE. Omaha arrangements are headed by Robert L. Meyer, representing the Missouri Valley Section of the Institute. Further information may be obtained from them or from the office of the Institute of Traffic Engineers, 2029 K Street N.W., Washington 6, D.C.

Urban Transportation Conference at Mich. State University

Michigan State University's Highway Traffic Safety Center will conduct a three-day conference on Urban Transportation Feb. 18-20 with the cooperation of state and national agencies.

The main purpose of the conference is to help local officials better solve problems of providing safe, efficient and rapid movement of motor vehicles and the emphasis will be on how communities may conduct their own transportation studies for solving local needs.

Conference sessions will be held at Kellogg Center located on the university's East Lansing campus.

Attending will be key municipal officials from Michigan cities of over 5,000 population representing the various agencies responsible for administration, traffic engineering, planning, financing and other aspects of urban transportation systems.

Broad purpose of the conference is to bring all municipal officials up to date with the complex socio-economic problems brought by the increasing use of the automobile and the increasing number of automobiles in use. The increasing orientation of population, industry and business to meeting the demands of automotive transportation and the resulting decline in public surface transportation may be a matter of life or death to many communities. A recognition of these problems and the need for intelligent planning to cope with them and related transit problems, prompted the National Committee on Urban Transportation to develop and organize the instructional manuals and guides for the use of municipal officials.

This conference at Michigan State University, the first of its kind in the nation, will use the materials developed by the national group. Experience and methods tested in seven pilot cities of the nation will be reviewed in the conference sessions. The National Committee on Urban Transportation is hopeful that the M.S.U. conference will prompt similar meetings in other states.

Subject matter to be presented at Michigan State University will include the role of transit in the community; street use and origin-destination studies; determination of existing levels of traffic service; inventory of the physical street system; financial records and reports; projecting future travel; adopting highway and traffic standards; determining present and future deficiencies, improved transportation administration and modernizing traffic laws and ordinances.

Invitations are being extended by the M.S.U. Highway Traffic Safety Center to Michigan's mayors, city managers, city engineers, regional and city planners, traffic engineers, police officers and other responsible municipal officials as well as state and planning engineers. Representations are also expected from Ohio, Illinois and Indiana.

Participating national agencies are the National Committee on Urban Transportation, the Bureau of Public Roads and the Automotive Safety Foundation.

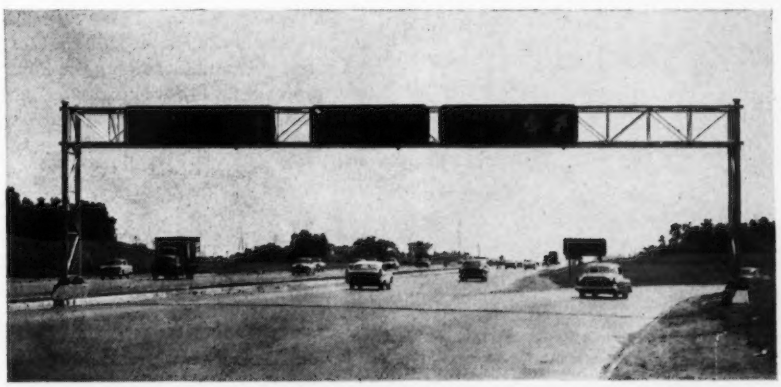
Computer Used at M.I.T. To Simulate Traffic Flow In Tunnels, On Bridges

A high speed computer is being used at the Massachusetts Institute of Technology to simulate the flow of traffic through tunnels, over bridges and on single-lane roadways — in an attempt to determine the parts played by individual drivers and vehicles in heavy traffic.

The Operations Research Center at M.I.T. is conducting the study with the help of the Port of New York Authority. Current work is focused on such places as the Holland and Lincoln Tunnels and the George Washington Bridge, but the research is applicable to conditions at heavy traffic areas around the country.

"In addition to being a problem of intense personal concern to us all," said Dr. Herbert Galliher, assistant director of the Center responsible for the study, "traffic flow invites the use of computers, mathematics and psychology to analyze the causes of bottlenecks. As everyone knows, traffic problems are not simple."

Walter Helly, 28-year-old physics graduate student at the Center, is using the IBM 704 Computer at M.I.T.'s Computation Center to simulate certain traffic conditions and study them. "I can study the actions of 100 cars in a simulated situation on the computer in the same time it would take me to



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study one car at, say, the entrance to the Sumner Tunnel in Boston," explained Helly.

The versatile computer at M.I.T. actually generates a picture of traffic situations, simulating the position of each car at intervals of a quarter of a second, and drawing lines between the points, so that delays, and varying distances between vehicles can easily be seen.

The essential task, the researchers explained, is to build into the simulation the proper characteristics of individual drivers. The Port of New York Authority has been assisting in a program to determine these characteristics. A special camera mounted high in the New York tower of the George Washington Bridge automatically recorded 90 times each minute the positions of cars crossing the bridge. When traffic speeded up or slowed down, an "accordion" effect was produced in the line of following traffic which will be analyzed to determine driver reactions to a continually changing traffic situation. Information obtained from the pictures is being reduced to data that will be fed into the computer, and this will simulate traffic conditions that will keep Helly busy for some time.

The immediate goal of the studies being conducted by Helly is greater knowledge of the nature of congested traffic flow, and measurement of factors that control it. For example, how much would a given flow be speeded up if stop and brake lights were placed so as to allow drivers to see them many cars ahead? How much do trucks slow down the overall flow? How much and how safely would compulsory minimum speed limits improve flow? How much does high horsepower contribute in permitting quick closing of traffic gaps by fast acceleration? How much additional flow would it be worth if driver reaction times could be speeded up? How much additional flow would result from giving drivers more information — even signs with general advice as well as warnings of specific hazards or intersections ahead?

"The simulation is an inexpensive way to answer these questions," explained Helly, "and as the Port of New York Authority emphasizes, even small increases in current flow are very valuable to the persons waiting for passage during heavy traffic periods."

Women's Clubs Initiate Major Traffic Safety Effort

The General Federation of Women's Clubs has announced the publication of a booklet, "Passport to Safety," as the kick off for the most ambitious traffic safety project ever attempted by its seven million members.

The Federation's Passport to Safety Program has as its obejective the improvement of driver performance through better license examinations requiring more complete preparation by driver license applicants and a strict traffic regulation enforcement program to remove unfit, incompetent and irresponsible drivers from the road through license suspension and revocation.

The booklet stresses that the clubwomen should not attempt to assume the role of safety experts, but should familiarize themselves with the licensing programs in their states, express their concern and interest in needed licensing reforms and offer their support to constructive official programs to improve state licensing procedures.

Effective licensing improvements will become legislative realities only when public officials are convinced that there is a public demand for them, the booklet points out. The members of the Federation are urged to give voice to this demand for licensing reforms.

Steelman Elected Board Chairman By Road Federation

Julien R. Steelman, president of The Koehring Company of Milwaukee, Wisconsin, today was elected chairman of the Board of Directors of International Road Federation, 1023 Washington Building, Washington 5, D.C. He succeeds H. S. Merriman, who has retired from the Socony Mobil Oil Company.

Mr. Steelman was elected by IRF's Board of Directors at a noon luncheon meeting. Ellis Armstrong, Commissioner of Highways of the United States, was the guest speaker at the meeting.

Mr. Steelman is past president of the American Road Builders' Association. He is also a former president of the Construction Industry Manufacturers Association.

Mr. Merriman has served on IRF's Board since its creation in 1948. He has served as Board Chairman since 1955. His replacement as a member of the IRF Board will be F. E. Powell, vice president of Mobil Overseas Oil Company, Inc.

International Road Federation is a non-profit service organization with offices in Washington, London and Paris. Through affiliated good roads associations in 64 nations of the free world, IRF promotes "Better Roads for Better Living."

The organization has been in existence since 1948. In October, IRF won the Christopher Columbus award for outstanding service to land transportation throughout the world. This award is given each year by the City of Genoa, Italy. Previous winners were Admiral Hyman Rickover, the British Post Office and Bell Telephone Laboratories.

Training Opportunities

March 2-20—TRAFFIC ENGINEERING SEMINAR
Sponsored by Northwestern University Traffic Institute and the Midwest Section, ITE. For traffic engineers and others with engineering backgrounds. Tuition $195. For information, address: Northwestern University Traffic Institute, 1704 Judson Ave., Evanston, Ill.

April 15-17—FREEWAY OPERATIONS SEMINAR
A seminar will be held at the Moraine Hotel, Highland Park, Illinois, under the sponsorship of the Midwest Section. Planners, engineers and enforcement officials who are or will be responsible for the planning, design or operation of controlled access facilities are invited. For reservation forms and further information, contact George Hagenauer, Illinois Division of Highways, 160 N. LaSalle Street, Chicago 1, Illinois.

April 20-22—FREEWAY OPERATIONS SEMINAR
A seminar will be held at the Town House, near Omaha, Nebraska, under the sponsorship of the Missouri Valley Section. Planners, engineers, and enforcement officials who are or will be responsible for the planning, design or operation of controlled access facilities are invited. For reservation forms and further information, contact Robert L. Meyer, Department of Roads, State Capitol, Lincoln, Nebraska.

May 11-13—FREEWAY OPERATIONS SEMINAR—
A seminar will be held at Bear Mountain Inn, Bear Mountain State Park, Bear Mountain, N. Y., under the sponsorship of the Metropolitan (N.Y.) Section of the ITE. Planners, engineers and enforcement officials in the New York Metropolitan area are invited. For reservation forms contact Gordon K. Gravelle, c/o Dept. of Traffic, 100 Gold St., N. Y. 38, N. Y.

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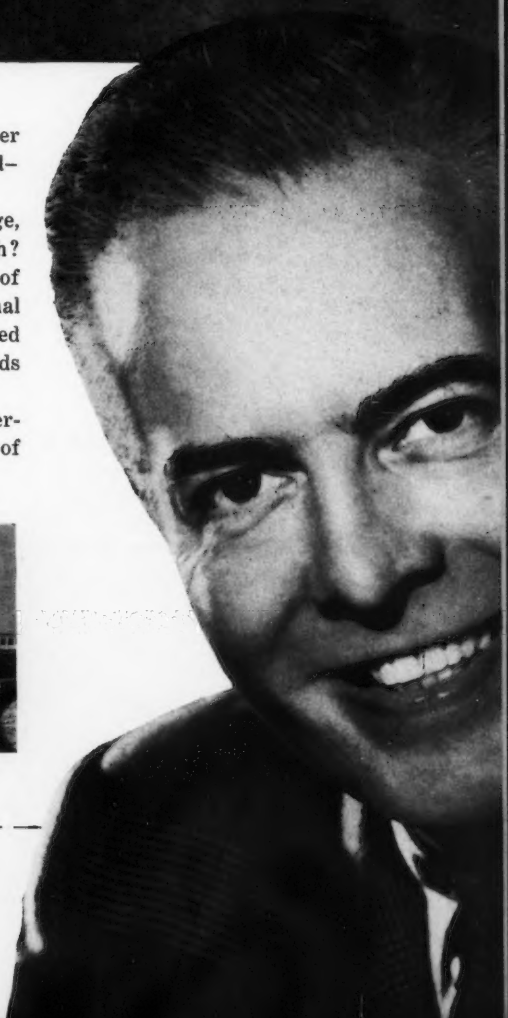
You can enjoy the advantages of dealing with an integrated organization too, because our associate, Traffic and Street Sign Company, manufactured the entire aluminum signing program for the Walt Whitman Bridge, and its nine miles of approaches. And, of course, they make an extensive line of traffic control signs for every application. For their catalog write for TSM.



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Letter to the Editor

Dear Sir:

In reading the excerpts from Mr. J. D. Williams' *Fortune* magazine story, several thoughts come to mind.

Mr. Williams argues that, "too much speed" is bad, but would leave determination of what constitutes "too much speed" to the motorist. The Uniform Vehicle Code limits speed to that which is "reasonable and prudent" under existing conditions while setting a maximum limit of 60 m.p.h. and 30 m.p.h. for rural and urban areas. These maximum limits would apply to the great bulk of our existing streets and highways, while the Code provides for raising or lowering of these limits as a result of special engineering studies. This proviso paves the way for higher limits on newer facilities where the proper authority (i.e. a traffic engineer) deems they are prudent.

The basic question that Mr. Williams asks is: Why do we attempt to control traffic? The answer to that question is fundamental to the society in which we live. Our individual freedoms have been, are and one hopes always will be, bound by the freedom of others. The freedom to move about is no exception. Thus, we have laws, both legal and moral. To break a legal law is always to break a moral law. One's energies are better directed at changing a law to conform to sensible practice rather than aggressively disregarding it. The Uniform Vehicle Code and The Model Traffic Ordinance are such sensible guides in the area of traffic control.

Certainly safety authorities realize there is no one shot cure-all panacea that will adequately solve our traffic safety problem. A broad "all points" program covering the field from highway to vehicle to driver has worked in the past as evidenced by the reduced fatality rate. A better program could get better results in the future. Traffic control is definitely a part of such a program.

MURRAY D. SEGAL
Traffic Engineer
National Safety Council

Dec. 24, 1958

Davis Gets Crum Award; Elected Chairman of Highway Research Board

Harmer E. Davis (Affiliate, ITE) was named on January 6 as the recipient of the Roy W. Crum distinguished service award for 1959. Davis, who is director of the Institute of Transportation and Traffic Engineering at the University of California, was later in the same session elected chairman of the Highway Research Board, the group which annually makes the Crum award. Last year the award went to E. H. Holmes, assistant Commissioner for Research of the Bureau of Public Roads.

The announcement was made at the opening session of the Board's 38th Annual Meeting in the Sheraton-Park Hotel by C. H. Scholer, Chairman of the Executive Committee and Professor of Applied Mechanics at Kansas State College.

The Highway Research Board is a cooperative organization of the highway technologists of America, operating under the auspices of the National Academy of Sciences — National Research Council and with the support of the several highway departments, the Bureau of Public Roads, and many other organizations interested in the development of highway transportation. The purposes of the Board are to encourage research and to provide a national clearinghouse and correlation service for research activities and information on highway administration and technology.

TRAFFIC ENGINEER HONORED

Alan M. Voorhees, Traffic Planning Engineer of the Automotive Safety Foundation (left) receives the Highway Research Board Award at that organization's 38th annual meeting in Washington, D.C., Jan. 7, 1959. C. H. Scholer, retiring Board Chairman and Head of the Applied Mechanics Department, Kansas State College is shown making the award, based on Voorhees's research report on methods of forecasting peak hour traffic.

Alan M. Voorhees Given Highway Research Board Award

Alan M. Voorhees (Assoc. Mem., ITE) traffic planning engineer of the Automotive Safety Foundation, Washington, D.C., was given the 1958 Highway Research Board Award at the recent meeting of the Board in Washington.

The presentation was made at the opening session of the Board's 38th Annual Meeting in the Sheraton-Park Hotel by C. H. Scholer, Chairman of the Executive Committee and Professor of Applied Mechanics at Kansas State College.

Established in 1940, the award is made annually to "recognize the authors of papers of outstanding merit." Mr. Voorhees' award-winning paper, presented at the 1958 meeting, was entitled "Forecasting Peak Hours of Travel," and suggested mathematical techniques for predicting future traffic volumes and characteristics, to replace costly and time-consuming questionnaire methods. The new techniques have been successfully tested during the past year in Baltimore, New Haven, and other cities.

A native of New Jersey and now residing in Bethesda, Maryland, Mr. Voorhees is an engineering graduate of Rensselaer Polytechnic Institute and holds a master's degree in city planning from Massachusetts Institue of Technology. He also is a graduate of the Yale Bureau of Highway Traffic, and prior to joining the Automotive Safety Foundation staff was City Planning Engineer for Colorado Springs, Colorado.

Chicago Park District Shifts TE Function To City of Chicago

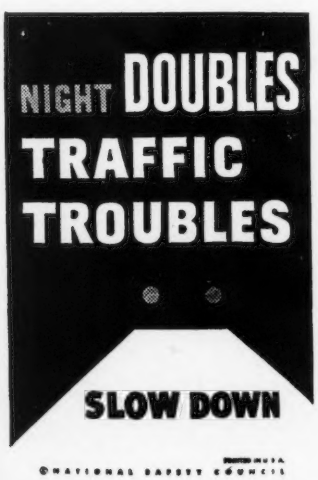
On January 1 the traffic engineering functions formerly carried on by the Chicago Park District were shifted to the City's Bureau of Street Traffic and Parking. Affected by the change were five Institute members. Three other members will remain at least temporarily with the Park District.

Those moving to the City were: Richard G. Fencl (Mem.); Marshall F. Davies (Assoc. Mem.); Walter L. Jolesch (Assoc. Mem.); Henry C. Peck (Assoc. Mem.); and Jack L. Sorenson (Assoc. Mem.).

Remaining with the Park District were: Robert F. Bilek (Assoc. Mem.); Richard Siepkowski (Assoc. Mem.); and Peter M. Page (Assoc. Mem.).

TITLE CHANGES

Dale E. Dugan—formerly Engineer in Training with the Kansas State Highway Commission; now a Civil Engineer in the Highway Planning Department at Topeka.



JOB CHANGES

Benedict G. Barkan—formerly a Research Associate at the Yale Bureau of Highway Traffic; now with Wilbur Smith & Associates in New Haven.

Charles E. Campeau—now a Consulting Engineer & Town Planner in Montreal; formerly was Director of the City Planning Department of Montreal.

Marshall F. Davies—from the Chicago Park District to the Bureau of Street Traffic & Parking in Chicago.

Richard G. Fencl—now Administrative Traffic Engineer with the Bureau of Street Traffic & Parking of Chicago; was with the Chicago Park District.

C. M. "Max" Gilliss — formerly Director of the State Department of Public Works at Sacramento; now Commissioner of the Los Angeles County Road Department.

Arnold A. Johnson—formerly Assistant City Traffic Engineer of Phoenix; now is Senior Highway Design Engineer with the Arizona Highway Department at Phoenix.

Walter L. Jolesch—from the Chicago Park District to the Bureau of Street Traffic & Parking of Chicago.

Teddy J. Morawski—from the U. S. Bureau of Public Roads in Washington to the Tennessee Division of BPR in Nashville as Planning & Programming Engineer.

Karl Noerr—from the Virginia State Highway Department in Culpeper to the Traffic Engineering Department of Madison, Wisconsin.

Oklahoma University Engineers to Study Traffic Counters

The world's largest manufacturer of traffic counters has asked University of Oklahoma engineers to improve its equipment.

Streeter-Amet Company of Grayslake, Ill., has contracted with the OU Research Institute for development of an optical device to both count cars and determine their speeds. Streeter-Amet manufactures about 98 per cent of the traffic counters used throughout the world, the company says.

The new counter, which will be effective both day and night, will replace the familiar rubber hoses, electric eyes and radar systems now in use. It is to be used in conjunction with standard recording equipment.

Verne C. Kennedy, Jr., executive director of the OU Research Institute, said use of the device would not be limited to auto traffic. "It will find extensive applications in connection with railroad, industrial and military problems," Kennedy said.

The project will be under the direction of James D. Palmer, OU assistant professor of electrical engineering.

Congressman Allen Nominated as Under Secretary of Commerce

Representative John J. Allen, Jr., of California has been nominated by President Eisenhower to be Under Secretary of Commerce for Transportation. Mr. Allen has been in the House of Representatives since 1947. His nomination is subject to confirmation by the Senate.

C. C. LENZ, SR.

Charles C. Lenz, Sr., one of the best known and most popular figures in the manufacturing end of the traffic signal field, died December 13 at his home in Easton, Conn. Mr. Lenz, who was 64, was president of the Marbelite Co., Inc., the Atlas Safety Equipment Co., both of Brooklyn, and of the Ruleta Co., Inc. of Bridgeport, Conn. He was well-known throughout the country because of the activities in this field and his attendance at many conventions and other gatherings, and was a veteran of World War I serving with the 305th Field Artillery, 77th Division. He was a member of St. John's Lodge, AF and AM of New York, Easton Exchange Club, Brooklyn Lodge #2, BPOE and Kells-Grennie Post, American Legion, Staten Island, N. Y. His activities in the traffic safety field brought him in contact with leaders in this industry for many years. He was a member of the International Municipal Signal Association and the International Association of Fire Chiefs, and active in the Metropolitan Section of the Institute of Traffic Engineers.

Surviving Mr. Lenz are his wife, Gertrude (Abbott) Lenz; a son, Lieut. Charles C. Lenz, Jr., now serving with the Army at Fort Monmouth, N. J.; a daughter, Eugenie Louise Lenz of New York City; a nephew, William E. Lenz, Haverstraw, N. Y. and a niece, Mrs. Henry Sauter, Nyack, N. Y.

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THE... *Shalda* MEASURE METER

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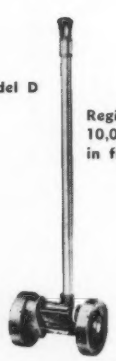

Registers up to 10,000 ft. in feet & inches.

Direct Reading • No Bells • No Counting
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Special for the TRAFFIC ENGINEER: Graduated in either 10ths or 12ths

The Shalda Measure Meter has been put to practical use by traffic engineers all over the nation. Its simplicity and accuracy has proven tremendously valuable in traffic engineering and has been accepted as a useful and practical tool.

- Rust, dust, moisture resistant, sealed in mechanism.
- Light, weighs only 3 pounds.
- Extension handle to 40 inches.
- Finest precision counters.
- Trouble free, factory lubricated.
- Handy, portable—only 23 inches long.

FAST!! SIMPLE!! ACCURATE!!

Automatically adds or subtracts.
No other machine has this feature.

Just walk it ahead—the precision computer clocks off feet and inches like an automobile speedometer...with equally simple reading. To subtract—just back it up.

At only $42.50 will pay for itself many times over.

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Strictly Business

Magni Flood Offers New Lightweight Outdoor Luminaire

Beauty, light weight, and efficiency are now combined in a modern streamlined outdoor luminaire. Called the "HI-LITE" by the manufacturer, Magni Flood, Inc. of Mt. Vernon, N. Y., the unit achieves these ends by boasting a body of rugged lightweight, polyester plastic, reinforced with molded glass; the bowl is made of molded clear acrylic plastic. Reflector and socket assemblies are fabricated from aluminum, oxidized, and polished to a high tarnish-resistant finish. With two 4′ PowerGroove lamps, and remote ballast, the contractor need carry a load of only 15 pounds with him when installing the fixture. Various mountings and crossarms are available for single or multiple assemblies. Light is engineered for a uniform elliptical pattern which can be increased by the addition of top reflector cut-off plates and internal 75° angled reflectors, making this appropriate for driveways, parking areas, supermarkets, shopping centers, gas stations, streets and highways. A six foot model of this unit is due on the market by later Winter. Complete information and engineering data is available from Magni Flood, Inc., 50 Crary Avenue, Mt. Vernon, N. Y., Dep't. NP.

Kaiser Offers New Booklet on Aluminum for Signs

The full range of availabilities of Kaiser Aluminum traffic control signs are reviewed in a recently published booklet with product and installation illustrations and complete specifications.

Kaiser Aluminum sign blanks are produced from a tough, high-strength sheet alloy, 6061-T6. Extruded highway signs are manufactured from another high-strength alloy 6063-T5 and T6.

The booklet describes the advantages of aluminum for traffic control signs, including lightness, corrosion resistance, strength, durability and the variety of finishes that can be achieved.

"Aluminum Traffic Control Signs" can be obtained free from Kaiser Aluminum & Chemical Sales, Inc., Department NR-18, 919 North Michigan Avenue, Chicago 11, Illinois.

New TORK PROGRAM TIME SWITCH with reserve power

Designed Expressly For Traffic Signal Control

#8007 SKLX SPDT with Skip Feature

Gives you finer accuracy:

- 96 tabs on 24 hour dial permit 15-minute switching changes.
- Tabs easily tilted in or out by hand.
- 1 to 48 operations a day—15-minute minimum setting.
- Switch position stays the same when adjacent tabs are set alike.
- No conventional ON-OFF trippers to slide around the dial.

Gives you these EXCLUSIVE safety features:

- Keeps time for more than 20 hours after power failure.
- Reserve Spring rewinds electrically 10 times faster than used.
- Reserve spring is automatically "exercised" each day — no chance of locked up spring failing to take over when needed.

Here's the safest, most accurate time switch made for traffic signal control. Enthusiastically acclaimed and specified by those who have seen and tested. it. WRITE NOW TO DEPT. T-1 FOR FULL DETAILS.

TORK TIME CONTROLS, INC.
MOUNT VERNON, NEW YORK

In Canada: DOMINION ELECTRIC MANUFACTURING CO., LTD., TORONTO

Rust Reported as Costing $25-Million In Sign Damage

Rusting highway signs and traffic signals cost the nation $25-million in 1958, according to a study recently released.

This represented a 20 per cent increase over the $21 million loss last year.

The study was prepared jointly by the Foundation for Management Research and the Rust-Oleum Corporation, Evanston, Ill., producer of rust preventive coatings.

Biggest single cause of the jump in rust loss was reported to be the widespread use of chloride salts for deicing highways, the study reported. Nothing corrodes metal as rapidly as salt in the presence of water and air, the study stated.

Use of the chloride salts in the winter causes rapid pitting of highway signs. When followed by spring rains and summer sun, severe rust results on signs that do not receive immediate rust-preventive treatment in early spring. Pitting works more rapidly than rust across a sign's whole surface and can render a sign useless in one year.

Increase in the nation's highway network as a result of the new building program was not related to the increased rust loss, the study said. Signs erected at new crossings and bridges were too new to have rusted.

The report said there were about 800,000 highway bridges in the country and 1,350,000 highway crossings, with an average of one sign to each, the study said. While some have none, other crossings have multiple signs. In addition, posted speed limits and other road warnings, including federal, state, county, and municipal signs, account for another 1,200,000 highway signs.

The study said there were approximately 775,000 traffic signal lights in operation nationally, costing an average of $100 each.

Half the signs and lights get some paint protection each year. These units average seven years life. The other half are largely neglected and last somewhat less than three years. In areas of the southeast and Gulf states, signs often rust to uselessness in one year, if not painted twice annually.

Brilliant New Enamel Is Unique Traffic, Parking Lot Paint

A tough new traffic paint that provides brilliant, long-lasting traffic markings on asphalt, macadam, concrete, cobblestone and tarred road surfaces, has been introduced by the Consolidated Chemical and Paint Manufacturing Co.

New "Jet-Dri" has been rigidly tested for road wear and driver visibility. Highway applications reveal the product retains its high lustre and bright color under consistently heavy truck, auto and pedestrian traffic conditions, according to the manufacturer.

HAVE YOU REACHED YOUR LIMIT ON CHEAP, FLIMSEY SIGNS?...

If you are tired of replacing your traffic-control signs year after year – then it's time to install long-life Miro-Flex signs. These quality signs are embossed on zinc-coated, Bonderized steel, and finished in high-grade, baked-on enamel. Embossing gives them greater strength, rigidity, and legibility than flat-surfaced signs. A complete line of uniform traffic-control signs, street-name assemblies, and custom-designed signs are available. Write for your free catalog and name of nearest source.

Embossed MIRO-FLEX SIGNS LAST and LAST...

THE MIRO-FLEX CO., INC.

1824 EAST SECOND WICHITA 7, KANSAS

Standard Traffic Signs Available for Immediate Delivery at Northeastern Warehouse

Koontz Equipment Corporation, 325 Ohio River Blvd., Emsworth, Pittsburgh 2, Pennsylvania

New Jet-Dri is applied in one operation — affording substantial cost and time savings. Its ease of application permits a small painting crew to cover miles of roadway in a minimum of time. Because it dries in minutes, it is reported that truck and auto tires leave no imprint on Jet-Dri surfaces. Nor can tires streak or smear Jet-Dri into unpainted road areas.

Ideal for use in busy parking lots, auto service stations, drive-ins, shopping centers, super markets, motor courts and other heavily traveled areas, new Jet-Dri may be applied rapidly by conventional highway painting equipment or by hand with brush or roller.

Drying to a tough, extremely wear resistant finish, Jet-Dri surfaces resist gasoline, oil, alcohol, most acids, alkalies and boiling water. Extremely weather proof, the new product is thinned with ordinary mineral spirits.

Developed initially as a highly protective and durable industrial enamel, the product's tough, fast-drying properties are the result of a newly developed resin base.

Available in gallon cans, five and fifty gallon drums, Jet-Dri is produced in non-fade traffic white, vivid roadway yellow, bright red, black, forest green and high visibility aluminum.

Additional information may be obtained from Jet-Dri Division, Consolidated Chemical and Paint Manufacturing Co., Inc., 444 Lafayette Street, New York, N. Y.

New Warning Light By Pacific Mercury Is Guaranteed Forever

A flasher warning light guaranteed forever is the most interesting feature of the new Pacific Mercury line of flasher warning lights.

In production now at Pacific Mercury's Joplin (Missouri) plant, the new lights are expected to revolutionize the entire field of flasher warning lights, for included in the line is a transistorized neon light, developed after long electronic research. The first on the market, the transistorized neon light is far brighter than lights now available, the company reports.

Both the neon and incandescent models of the new lights feature an epoxy encapsulated cartridge with a patented circuit. A special circuit extends battery life to from four to eight months.

Due to the lens design and special engineering of the transistor elements,

intensity has been increased so the manufacturer reports that visibility of the Pacific Mercury lights now exceeds three miles, weather conditions permitting, of course.

Designed for efficient, economical operation and exceptionally low maintenance, the Pacific Mercury lights will operate in any extremes of temperature. A Solarstat automatically turns the lights on when the sun sets, turns the lights off when the sun rises. Thus, the Solarstat ends manual attention.

Outer housing of the new light is of copper-aluminum-magnesium alloy for durability and weatherability. It was designed by Porter Associates, leading Midwestern industrial designers.

Lights are available now from Pacific Mercury's marketing headquarters at 14052 Burbank Boulevard, Van Nuys, California. They come with any standard color lens, and in four-inch head models, seven-inch reflectorized, and 360° dome-type lens.

New Plastic Trafficones Developed by Interstate Rubber

A complete line of Trafficones, adapters and accessories made of poly vinyl chloride (plastic) has been developed by the originator of rubber Trafficones, Interstate Rubber Products Corp., 908 Avila St., Los Angeles 12, Calif. These new plastic cones are available in all three standard sizes, — 12″, 18″ and 28″. Heavily constructed and properly engineered to resist greater wind velocities, according to the manufacturer, these cones of tough, flexible plastic will withstand the rough wear and abuse required by everyday use. Pigment is impregnated throughout the compound producing brilliant red and yellow colors for better visibility. The fast colors will remain bright and effective for years, and no painting or maintenance is required.

American Concrete Offers New Catalog On Stress-Spun Lighting Standards

A new, 28-page loose-leaf catalog devoted to Hy-Lite stress-spun concrete standards for street and highway lighting, has recently been made available by The American Concrete Corporation.

Informative and easy-to-read, this catalog contains complete engineering tables and descriptive information on design features and mounting arrangements of the complete line of Hy-Lite standards, including several new designs.

Also included in the catalog is data on a choice of base types including precast butt, bolt-down and transformer. In addition to numerous installation photos, several pages deal with special upright standards, the making of Hy-Lites, and detailed specifications.

This fully illustrated catalog and binder is identified as American Concrete Catalog No. 400, titled "Stress-Spun Standards for Street and Highway Lighting." Copies may be obtained by writing the American Concrete Corp., 5092 North Kimberly Avenue, Chicago 30, Illinois.

Porcelain Enameled Aluminum Opens New Vistas

Porcelain enamel on aluminum is described as the most modern approach to finishing of fabricated aluminum in a new brochure by Argosy Industries, Inc., Middletown, Conn.

Because vitreous enamel is fused to the aluminum, it is said to greatly increase the rigidity of the metal. Where resistance to impact, chemicals, abrasion, heat, fading, streaking or staining is important, porcelain enameled alumium has proved to be the economical answer. It is claimed that signs, nameplates, dials, scales, or parts fabricated of porcelain fused to aluminum will never progressively spall under any method of mounting or securing.

Porcelain enameled aluminum is color-fast. Eye-catching designs and lettering in a wide range of beautiful colors are fused to the aluminum. In-

numerable variations of surface texture are possible. The light weight of the aluminum reduces handling and shipping costs.

Copies of the brochure, "Fused to your Needs," may be secured without cost or obligation from Argosy Industries, Inc., North Main and Grove Streets, Middletown, Conn.

Dietz Announces Research Grant On Portable Hazard Warning Devices

The R. E. Dietz Company, Syracuse, New York, has announced a grant to the Regents of the University of California, Berkeley, California, for the support of a one-year study entitled "Portable Roadway Hazard Warning Devices."

The research grant, presented by Raymond Burrows, Sales Manager of the Dietz Hazard and Portable Lighting Division, to W. W. Monhan, U. of C. business manager, will be under the direction of Professor D. M. Finch.

Purpose of the grant which will supplement continuous studies of the Dietz safety research staff in laboratories and on actual job locations, is to insure that hazard warning devices offer the best possible protection in terms of product design and performance, and that users can be more fully educated to their proper use and maintenance. "The burgeoning federal highway program, the growing number of urban arterial projects, and the steadily rising car population travelling at high speeds," Mr. Burrows said, "make it imperative that the problem of satisfactory hazard protection be constantly reassessed."

Major items in the Dietz product line of hazard warning lights, largest in the world, are torches, lanterns, and the recently developed Visi-Flash transistorized electronic flashers.

Positions Available

DULUTH, MINNESOTA

Position: Traffic Engineer, to direct City Traffic Engineering Bureau.

Requirements: B.S. in engineering from accredited institution, with some specialized traffic engineering training preferred, plus at least two years of responsible experience in traffic engineering.

Salary: $586 to $713 per month, plus health and life insurance benefits.

Apply: Applications for examination may be obtained from the
Civil Service Board
402 City Hall
Duluth, Minnesota

ACCIDENT EXPERIENCE

(Continued from page 23)

Furthermore, the application of corrective measures where indicated by this study could immediately result in an overall reduction of the highway accident toll.

Any steps taken to improve safety equipment, such as tail lights, to produce the maximum improvement in a minimum length of time would require the abandonment of the "grandfather clause" so commonly accepted in the revision of our motor vehicle codes. In the past eight years, the tail lamp candlepower requirements have increased at least four-fold. It will, however, be years before every vehicle will be required to have what could be termed a satisfactory tail light.

To achieve greater highway safety requires an active pursuit of all the facets involved in vehicle and highway operations. Until such time as we are willing to accept and undertake the necessary improvements to highways, vehicles and equipment, safety cannot be achieved to any major degree.

Author's Note

The factual data and statistics quoted in this report were derived from the New Jersey State Police, Troop "D", Accident Reports, and from records of the Traffic Engineering and Toll Audit Departments of the New Jersey Turnpike Authority. The analysis and summarization of these records and the findings expressed in the study are those of the author and do not necessarily reflect the findings or opinions of the New Jersey Turnpike Authority and the New Jersey State Police.

METROPOLITAN DADE COUNTY, FLORIDA

Position: Traffic Planning and Design Engineer, Department of Traffic and Transportation.

Requirements: Graduation from recognized school in civil engineering. Graduate work in traffic engineering or land planning desirable. PE in Florida or ability to qualify for such registration. Approximately four years experience as traffic engineer or designer.

Salary: $534 to $680 per month, with fringe benefits. Civil service.

Apply: Department of Traffic and Transportation
Metropolitan Dade County
1357 N. W. 11th Street
Miami 52, Florida

WHERE IS THE MONEY?

(Continued from page 13)

wiser to face the music now than it is to delay the issue. It will cost less to do it on a pay-as-you-go basis. *(In any event, it should be clearly understood that more funds than are presently authorized will be required later if there is to be no stretch out.)*

Aside from the emergence of some magician who could provide the cash without running afoul of the FBI, or a cessation of cold war which appears equally impractical at this point, the speaker knows of no other course of action which has yet been suggested that would pass the practical test of congressional action.

One thing remains clear, however. The people of the United States are insistent upon getting forward with the road program. They know what it means to be fouled up in traffic congestion. They know the hazards of rural driving on inadequate roads. They know that one way or another they must pay for roads whether they get them or not.

The men and women who are members of Congress, generally, are motorists themselves, and better informed than most of the rest of us on the needs.

They have met this test twice now.

They will not fail to meet it a third time.

Coming Events

February 26-27—ILLINOIS TRAFFIC ENGINEERING CONFERENCE—
University of Illinois, Urbana, Ill. Contact: John E. Baerwald, 401 Civil Engineering Hall, Urbana, Illinois.

March 1-3—SOUTHERN SAFETY CONFERENCE
Battery Park & George Vanderbilt Hotels, Asheville, N. C. Contact: W. L. Groth, Exec. Dir., P.O. Box 8927, Richmond 25, Va.

March 23-25 — WESTERN SAFETY CONGRESS —
Ambassador Hotel, Los Angeles, California. Contact: Joseph M. Kaplan, Greater LA Safety Council, 3388 W. 8th St., LA 5, Calif.

April 14-16—MICHIGAN SAFETY CONFERENCE
Civic Center, Lansing, Michigan. Contact: Gordon H. Sheehe, Highway Traffic Safety Center, M.S.U., East Lansing, Mich.

May 10-14—AMERICAN SOCIETY OF PLANNING OFFICIALS—
Annual Conference, Hotel Leamington, Minneapolis, Minn. Contact: ASPO, 1313 East 60th Street, Chicago 37, Ill.

Sept. 14-17—INSTITUTE OF TRAFFIC ENGINEERS
29th Annual Meeting, Commodore Hotel, New York, N. Y. Contact: ITE, 2029 K St. N.W., Washington 6, D. C.

Institute Affairs

SUMMARY OF BOARD OF DIRECTION MEETING JANUARY 9-10, 1959, AT WASHINGTON, D.C.

The Board of Direction met in Washington, D.C. on Friday and Saturday, January 9 and 10, 1959, and took the following action:

1. Approved plans of President Sielski and a steering committee for a workshop in Chicago in May, to discuss Institute affairs and a course of future action for the organization, with attendance by invitation.
2. Adopted a report from a special committee studying Sustaining Organizations calling for an increase in contributions from such groups to a minimum of $300 a year (up from $100), a study of magazine advertising rates, an increase in Annual Meeting registration fees, one night of planned entertainment at Annual Meetings, and the establishment of specific rules for operation of hospitality rooms at Annual Meetings.
3. Heard a tellers' report that the proposal to increase dues for Institute members fell short of the required two-thirds vote and was therefore lost.
4. Adopted a balanced budget for 1959 based on an increased subscription rate for the magazine, increased registration fees at the Annual Meeting, and expected increases in the amount of magazine advertising. Adopted a supplemental budget based on Sustaining Organizations contributions which will be available for technical development of the Institute.
5. Voted to elect four new Junior Members, two new Associate Members, and to transfer two members to a higher grade.
6. Voted to invite Paul F. Royster, Assistant to the Federal Highway Administrator, and John W. Gibbons, Director of Publications for the Automotive Safety Foundation, to become Affiliates.
7. Voted to extend an invitation to Southern Signals, Shreveport, La., to become a Sustaining Organization for 1959, as well as all 1958 Sustaining Organizations.
8. Approved a change in the By-Laws of the Canadian Section relating to Section Affiliates.
9. Heard a report from a committee proposing a new grade of Student Member.
10. Approved plans for the New York meeting, and voted to eliminate the Biscuit Banter Breakfast from this meeting.
11. Affirmed existing District boundaries for another year, pending a final report from a Board committee studying the question.
12. Adopted revised rules of procedure for the Technical Council, and heard of progress being made in appointed standing committees for each Department.
13. Accepted the resignation of Robert J. Allen as Secretary of the Technical Council, expressing appreciation to him for his devoted service. Appointed David M. Baldwin as Secretary of the Council.
14. Voted to transfer former Committee 2F, concerned with the Annual Inventory of Traffic Safety Activities, from the Technical Division to the Administrative Division, and re-constitute the committee.
15. Approved as a Recommended Practice a report submitted from Committee 6F dealing with "Special Parking Lots."
16. Decided that the Institute would again make awards to cities and states for traffic engineering performance as reported for 1958 to the Annual Inventory program.

New Rules of Procedure Approved for Technical Council

The Technical Council, meeting in Washington on January 3 and 4, adopted new Rules of Procedure, which in turn were approved by the Board of Direction on January 10, 1959. The revised rules are as follows.

RULES OF PROCEDURE OF THE TECHNICAL COUNCIL

ARTICLE I — Objective

Sec. 1. The objectives of the Technical Council are to encourage and promote the research and technical activities of the Institute and to make traffic engineering knowledge and techniques available in published form.

Sec. 2. The media for publication of technical material and reports produced by technical committees shall consist of the following: TRAFFIC ENGINEERING Magazine, Traffic Engineering Handbook, special ITE technical reports, standards and recommended practices, and technical papers for presentation at the Annual meeting.

ARTICLE II — Membership

Sec. 1. The voting membership of the Council shall consist of one of the Vice-Presidents of the Institute designated by the President, who will be Chairman of the Council, Technical Department Heads, and the Secretary of the Council. All members of the Council shall be voting members of the Institute.

Sec. 2. Voting members of the Council shall be designated by the Board of Direction and shall hold office until notified otherwise or until their successors are appointed.

Sec. 3. The President and Executive Secretary of the Institute shall be exofficio members of the Council.

Sec. 4. Upon recommendation of the Council, the President may appoint members or non-members of the Institute as non-voting members of the Council when it appears in the opinion of the Council that such members will be able to contribute materially to a project of the Council, and at the conclusion of that project his term shall expire.

ARTICLE III — Responsibility of Council Members

Sec. 1. In discharging their responsibilities, the members of the Council, and the members of the technical departments under its jurisdiction, function independently as individuals, and not as agents or representatives of the organizations by which they are or may be employed.

ARTICLE IV — Powers and Duties

Sec. 1. The Council is an agency of the Institute of Traffic Engineers Board of Direction with authority to direct and supervise all techni-

cal division activities of the Institute, including its participation in the technical committee activity of other organizations; subject only to Board of Direction concurrence.

Sec. 2. The Council will make recommendations to the Board of Direction for technical department activities to be undertaken for, or in cooperation with government, industry, other technical societies, educational institutions and civic organizations.

Sec. 3. The Council will make recommendations to the President of the Institute for appointment of Institute representatives on the technical committees of other organizations in which the Institute may participate.

Sec. 4. The Council will coordinate and review the work of its technical departments and of the representatives of the Institute on the technical committees of other organizations in which the Institute may participate.

Sec. 5. The Council will review, approve and certify to the Board, for concurrence as to Institute policy, the technical content of reports which recommend practices, standards, warrants, definitions or policies to be issued in the name of the Institute.

Sec. 6. The Council may authorize for publication as informational reports such material as is not described in Section 5 above.

Sec. 7. The members of the Council shall comprise a Committee on Technical Sessions, which shall be responsible for the selection of speakers and the organization of the technical sessions for each Annual Meeting. The Chairman of the Council will designate a chairman of the Committee, and may appoint additional members if necessary.

ARTICLE V — Technical Departments

Sec. 1. The Council will operate through seven technical departments under which the technical activities of the Institute will be conducted. They are as follows:

Dept. 1 Joint Committees
Dept. 2 Professional Standards, Education, Administration and Traffic Study Techniques
Dept. 3 Traffic Operations Measures
Dept. 4 Applications of Traffic Control Devices
Dept. 5 Planning and Geometric Design of Traffic and Pedestrian Ways
Dept. 6 Planning and Geometric Design of Terminal Facilities
Dept. 7 Design of Equipment

Sec. 2. Department 1 shall consist of a Head and all Institute representatives on the technical committees of other organizations. The internal operation of this Department shall be determined by the Department Head with the approval of the Council.

Sec. 3. All other Departments shall consist of a Head, a Standing Committee of five members and up to three Project Committees. Additional Project Committees may be appointed only with specific approval of the Council.

Sec. 4. The Council shall define the scope of each Department, determine projects to be undertaken by the Department, and authorize Project Committees.

Sec. 5. Members of Standing Committees shall consist of members of the Institute of Traffic Engineers. Non-members of the Institute may serve on Project Committees but as non-voting members.

ARTICLE VI — Departmental Procedure

Sec. 1. Department Heads shall annually appoint members of committees within the Department and designate a chairman of each Project Committee. The Department Head may designate an Assistant Department Head.

Sec. 2. Under the chairmanship of the Department Head, the Standing Committee shall consider the needs and opportunities for technical activity within the scope of the Department, shall make recommendations to the Council for specific projects, and shall review all Committee reports before presentation to the Council.

Sec. 3. Each Project Committee shall be assigned a specific project, which shall be prosecuted vigorously to the end that a report be completed and that standards, warrants and recommended practices be proposed if appropriate.

Sec. 4. Each Project Committee shall be given a definite period, preferably not over one year, for the completion of an assigned project. If the Project Committee determines that there is a need for additional time or for a related project, suitable recommendations shall be made to the Department Head.

Sec. 5. Departments shall hold at least one meeting per year, at such times and places as the Chairman may determine, except that one meeting shall occur at the time of the Annual Meeting of the Institute.

Sec. 6. The Council shall establish such additional administrative procedures as necessary to carry out these purposes.

ARTICLE VII — Departmental Reports

Sec. 1. It shall be the duty of each Department Head to submit to the Secretary of the Council periodic reports of the activities of the Department.

ARTICLE VIII — Council Meetings

Sec. 1. The Council shall meet at least once each year at such times and places as the Chairman may determine, except that one meeting shall be held at the time of the Annual Meeting of the Institute.

Sec. 2. Council meetings will normally be open to all members of the Institute, but executive sessions may be held upon majority vote of the Council.

Sec. 3. The Chairman of the Council shall preside at meetings of the Council and, if he is not present, the Council may select a Chairman pro tem.

Sec. 4. Department Heads may designate in writing an alternate for a specific meeting, who shall act for the Department Head.

Sec. 5. A majority of the voting members of the Council shall constitute a quorum.

Sec. 6. Action by the Council shall be by majority vote of the voting members present.

Sec. 7. When questions of parliamentary procedure arise, they shall be determined by Robert's Rules of Order.

ARTICLE IX — Records

Sec. 1. The Secretary of the Council shall provide for the recording of minutes of meetings of the Council and for their distribution.

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Sec. 2. The records of the Council and its departments and committees shall be maintained in the office of the Institute.

ARTICLE X — Amendments

Sec. 1. Amendments to these rules of procedure shall be adopted by an affirmative vote of two-thirds of the voting membership of the Council, shall not conflict with the Institute constitution and by-laws, and shall take effect upon concurrence by the Board of Direction.

Adopted by the Technical Council January 3, 1959

Approved by the Board of Direction January 10, 1959

Radio Frequency Allocation Sought from FCC for Traffic Control

A special committee with representation from the Institute of Traffic Engineers, the International Municipal Signal Association, the American Association of State Highway Officials, and the Electronic Industries Association has been established to prepare a joint petition to the Federal Communications Commission for the assignment of radio frequencies specifically for the purposes of traffic control.

The committe, which is an *ad hoc* group, was formed following a meeting held recently in Washington at the call of the Radio Committee of IMSA. Present among others were Kenneth W. Smith, Alexandria Traffic Engineer and Traffic Committee chairman of IMSA, Edward F. Cleary, Assistant Commissioner of Traffic in Baltimore, Walter J. Addison, Baltimore County Traffic Engineer, Henry Hulme, Traffic Engineer of Arlington County (Va.), William Dillon, U.S. Bureau of Public Roads, and Herbert Friede, representing Wallace L. Braun of the D.C. Highway Department.

Named to the *ad hoc* committee were Edward Cleary, representing ITE, Kenneth Smith, representing IMSA, William Dillon, representing AASHO, and a yet un-announced representative of the industry group. An ex-officio member will be Tom O'Brien, New York City Deputy Fire Chief and chairman of the IMSA Radio Committee.

Primary purpose of the committee will be preparation of a petition to FCC urging the designation of radio frequencies for the purposes of traffic control. Such use of radio is now au-

thorized only as a "secondary use" for existing frequencies, and the growing demands for this type of service indicate an urgent need for recognition by FCC of the principle of exclusive traffic control frequencies.

Suggestions and assistance will be welcomed by Mr. Cleary, who should be addressed at 401 E. Pratt St., Baltimore 2, Maryland.

Western Section Offers Award for Best Paper In TE Magazine

The Western Section has announced an annual award to the member of the Western Section writing the best paper to appear in TRAFFIC ENGINEERING magazine during the year. The award is tentatively set at $25.00, but the amount may be changed in the Section's budget. Judging of entries is in the hands of the editorial committee of the Section.

The rules as announced by Martin J. Bouman, chairman of the editorial committee, are as follows:

(1) The amount of the award shall be $25.00, or such amount as may be established in the Section budget at the annual meeting.

(2) The award shall be made to that Junior Member, Associate Member, or Member of the Western Section who in the opinion of the Editorial Committee has written the best professional article or paper to appear in Traffic Engineering. Magazine starting with the June issue and ending with the May issue prior to the Western Section Annual Meeting.

(3) The article must be on a technical or professional topic related to traffic engineering.

(4) In the case of a co-authored article or paper, the award shall be divided equally among such co-authors as are members of the ITE. Non-ITE members shall not be eligible for any portion of the award.

(5) There is no restriction as to length or literary style, nor shall it be a basis for judging.

(6) The award is to be made on the basis of reader interest and contribution to the profession.

(7) The winning paper for the Past President's Award is not eligible for this award.

(8) The winner will be announced and the award made at the Western Section Annual Meeting.

(9) No member of the Editorial Committee shall be eligible, except

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that an article published in TRAFFIC ENGINEERING during the author's service on the Editorial Committee shall make him eligible for the award in the next subsequent year that he is not a member of the Editorial Committee.

Past Presidents' Award Committee Formed

The Past Presidents' Award Committee has been established for 1959, under the chairmanship of Joseph E. Havenner, the immediate past president. This appointment was made by the Administrative Vice-President, Edward G. Wetzel, who also named as members of the committee Burton W. Marsh, J. Carl McMonagle, Charles W. Prisk and Thomas J. Seburn.

This committee is charged with administration of the Past Presidents' Award program under which an outstanding paper by one of the younger members of the Institute is recognized. A certificate is presented, and the winner is invited to present the paper or a synopsis of it at the Annual Meeting, with travel expenses paid.

The competition is open to all members of the Institute under 35 years of age. Papers should report some original research, but need not be elaborate doctoral-type dissertations. Papers may have been previously published, but within the past three years. The closing date is July 14, 1959, two months prior to the opening of the Annual Meeting in New York City.

Eligible members are urged by the committee to begin thinking now about preparation of a paper. Older members are urged to encourage younger co-workers or friends to develop papers for the competition.

Last year's winner was Martin Wohl, of the staff at M.I.T., who came to Miami Beach at Institute expense to present a synopsis of his paper on continuous strip aerial photographic methods of determining vehicle speeds and volumes. In 1957, the winner was Eugene J. Lessieu, of the N. Y. Port Authority, who presented a paper in Detroit on certain operational characteristics of ramps leading to expressways.

Detailed rules are available from Institute headquarters in Washington.

New Publications

Proceedings of the 44th Annual Road School

Engineering Bulletin, Extension Series No. 95, Engineering Extension Department, Purdue University, Lafayette, Ind. December 1958. 182 pp. Free.

This bulletin contains papers presented at the Purdue Road School held in April 1958 on the campus at Lafayette. Of interest to traffic engineers will be the following papers:

The County Road Problem and the Interstate System, by A. E. Johnson, Executive Secretary, AASHO.

Integration of Land-Use and Highway Planning, by Glenn C. Richards, Detroit Commissioner of Public Works.

Planning Highways for Industrial Developments, by Dorothy C. Muncy, Washington, D.C., Planning Consultant.

The Value of Planned Access on Urban Bypasses, by Charles Pinnell and Harold Michael, Joint Highway Research Project, Purdue.

How Can Counties Develop an Adequate Traffic Safety Program?, by Hallie L. Myers, Executive Director, Indiana Traffic Safety Foundation.

Urban Research in Highway Planning

Bulletin 190, Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C. October 1958. 40 pp. $0.80.

This Bulletin contains five papers presented at the 37th Annual Meeting of the Highway Research Board.

The first, by Paul C. Watt, describes the "Planning and Research Implications of the Washington Transportation Study."

In the second, Harvey S. Perloff tells how "Regional Research and Highway Planning," is providing a growing pool of knowledge and analytical techniques which have potential value for highway planning.

In the third, Leonard J. Duhl discusses the relation between the "Physical Environment and Mental Health."

In "Urban Arterial Developments Which Benefit the Community," Earle Andrews sets forth the principles adopted by the New York State Council of Parks.

In the final paper, Louis B. Wetmore outlines a "Visual Approach to Highway Planning and Design" in terms of pleasure and satisfaction, safety and convenience, and economic values.

Highway Needs Studies—1958

Bulletin 194, Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C. December 1958. 60 pp. $1.20.

This bulletin contains seven papers presented at the January 1958 meeting of the Board, as follows:

What Should Highway Needs Study Reports Contain? by Homer A. Humphrey and James A. Foster.

A Highway Taxation Cost-Benefit Analysis, by Bertram H. Lindman.

Indiana's Highway Needs Study, by D. O. Covault.

Analysis of County Road Management Functions, by John B. Benson, Jr.

Traffic Growth Patterns on Rural Highways, by Theodore F. Morf and Frank V. Houska.

Vehicle Delay at Signalized Intersections as a Factor in Determining Urban Priorities, by R. N. Grunow.

Tennessee's Programming Study: First Year's Experience and Techniques for Updating, by Philip M. Donnell.

Outdoor Advertising Along Highways

Special Report 41, Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C. December 1958. 101 pp. $4.00.

This special report, a project of the Committee on Highway Laws, compares existing State statutes with the standards set for the Interstate High-

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way System. A second section of the report includes a discussion of the legal concepts pertaining to property interests, the regulation of outdoor advertising under the police power, and the control of outdoor advertising through eminent domain.

Night Visibility—1958

Bulletin 191, Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C. October 1958. 64 pp. $1.40

This bulletin contains eight papers, abstracts of two informal papers, and a summary of a discussion presented at the Night Visibility sessions of the 37th Annual Meeting of the Highway Research Board. Included are the following:

A Color Comparator for Lights in the Vicinity of Traffic Signals, by D. M. Finch and Jerry Howard.

Optical Properties of the Atmosphere and Highway Lighting in Fog, by B. S. Pritchard and H. Richard Blackwell.

Experimental Studies of Night Vision as a Function of Age and Changes in Illumination, by Ross A. McFarland and Richard G. Domey.

Night Legibility Distances of Highway Signs, by Terrence M. Allen.

Efforts to Improve Visibility in Fog, by C. R. Marsh.

Aiming for Better Headlighting, by Val J. Roper.

Relation Between Scotopic Vision as Measured by the Night Sight Meter, Daylight Vision and Age, by A. R. Lauer.

Vision at Levels of Night Road Illumination. III. Literature 1956-7, by Oscar W. Richards.

Comparison of Driver Behavior on Lighted and Unlighted Highways (Abstract), by O. K. Normann.

Lighting the Conecticut Turnpike, (Abstract), by Ernest T. Perkins.

Field Test of Roadway Lighting (Summary), by Edmund R. Ricker.

Careers In Highway Traffic Safety

National Commission on Safety Education, National Education Association, 1201 Sixteenth Street NW, Washington 6, D.C. 1958. 61pp. $1.00

This volume is a summary of specialized occupational information dealing with work in the field of highway traffic safety. It was developed by a committee under the chairmanship of Frank L. Sievers, chief, Guidance and Student Personnel Section, U.S. Office of Education. Representing the Institute of Traffic Engineers on the committee was Robley Winfrey, formerly personnel officer of the U.S. Bureau of Public Roads, and now in the engineering division of the Bureau. Other engineers on the committee were John H. Acuff, assistant secretary, AASHO, and Seymour Coffman, highway engineer, Automotive Safety Foundation.

Individual sections of the report are devoted to Engineering and Technician Careers, Teaching Careers, Motor Vehicle Fleet Supervision, Police Traffic Supervision Careers, Motor Vehicle Administration, and Occupational Opportunities in Traffic Courts.

The engineering section presents an interesting discussion of the relationship between "highway engineers" and "traffic engineers," as well as differentiating clearly between "engineers" and "technicians." The booklet will be of interest to guidance counsellors and to engineers who must explain their profession to inquiring students and others.

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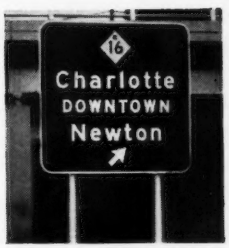

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By action of the Board of Direction
January 9, 1959

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COLEMAN, James E. (Associate)
Special Projects Officer, Captain, Transportation Corps, Department of the Army, OSATE, Washington 25, D.C.

KOERT, Adrian H. (Member)
City Traffic Engineer, City Hall, Des Moines, Iowa

NEW MEMBERS

COX, Donald J. (Junior)
Assistant Highway Engineer, Washington State Highway Department, Transportation Building, Olympia, Washington

DUNWIDDIE, Bruce R. (Associate)
Senior Engineer II, Missouri State Highway Commission, Highway Building, Jefferson City, Missouri

FARMER, Justin F. (Junior)
Traffic & Planning Engineer, Porter, Urquhart, McCreary & O'Brien, 1140 Howard Street, San Francisco, California

GIBBONS, John W. (Affiliate)
Director, Public Relations, Automotive Safety Foundation, 200 Ring Building, Washington 6, D.C.

MELZER, William T., Jr. (Associate)
Associate Signal Engineer, Department of Highways & Traffic, District Building, Washington 4, D.C.

RAMSEY, William A. (Junior)
Traffic Engineer, City & County, 410 South Jefferson Street, Pensacola, Florida

ROTMAN, Morris (Junior)
Traffic Analysis Supervisor, Department of Public Works, City, 129 Adelaide Street West, Toronto, Ontario, Canada.

ROYSTER, Paul F. (Affiliate)
Assistant to the Federal Highway Administrator, U.S. Bureau of Public Roads, Washington 25, D.C.

MEMBERSHIP APPLICATIONS

APPLICATIONS FOR TRANSFER

ARTALE, Jack A.
Senior Highway Designer, Goodkind & O'Dea, 325 Spring Street, New York 13, New York. December 10, 1958 for ASSOCIATE grade.

BILLION, Charles E.
Principal Civil Engineer, Bureau of Highway Planning, N. Y. S. Department of Public Works, A. E. Smith Office Building, Albany, New York. January 2, 1959, for MEMBER grade.

CHANN, Irving K.
Traffic Engineer, Parsons, Brinckerhoff, Hall & Macdonald, 165 Broadway, New York 6, New York. January 8, 1959 for ASSOCIATE grade.

(Continued on page 48)

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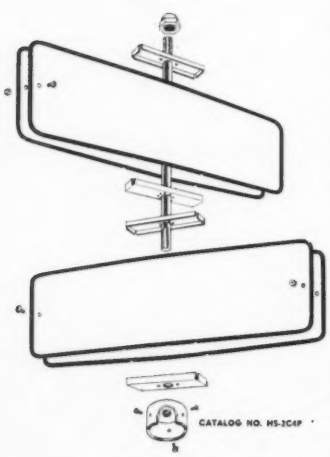

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INDIANA SECTION

The annual meeting of the Indiana Section was held in Indianapolis on December. A feature of the meeting was a speech by National President Matthew C. Sielski, who spoke about his recent survey of a number of members of the Institute to determine needs of the organization. He stressed the importance of Sections in the national organization, indicating ways that this relationship could be strengthened.

Mr. Eugene Barton, Director from District 3, was also present and spoke briefly about his desire to represent all members in his District.

Officers for 1959 were elected as follows: President: James H. Cox, 1st Vice President: Stanley T. Siegel, 2nd Vice President: Frank S. Vukovits, Secreary-Treasurer: Harold L. Michael.

NEW ENGLAND SECTION

The second meeting of the New England Section of the I.T.E. for 1958-1959 was held at Wonder Bar Restaurant, Berlin, Connecticut on December 10, 1958. Forty-six members and guests were present.

Fred Hurd reported on activities at the Annual Meeting of the Institute of Traffic Engineers' which had taken place in Miami Beach, Florida the previous month. He reported on various activities and in particular discussions centering on organizational matters. He discussed the question of membership in sections and the decision that a member can be a member of only one section. He discussed the section affiliates and the problems of how the relationship to the Institute should be defined on the local level. He stated that it had been decided that no action would be taken at this time and that the local relationships would be established by each section. He reported that there was discussion of accepting contributions from sustaining organizations to technical committees for research purposes.

Mathew Huber reported that the metropolitan New York Section, which will conduct the 1959 Annual Meeting, has requested the New England Section to undertake responsibility for the Biscuit Banter Breakfast. In his discussion he brought out the suggestion that arrangements be such that direct participation by membership be utilized rather than professional entertainers and requested cooperation of the section members. It was moved by Earl Flynn, seconded by Robert Williston put to a vote and passed that the New England Section undertake presentation of the Biscuit Banter Breakfast at the 1959 Annual Meeting. President Gove then appointed the following committee:

William R. McGrath, Chairman; Thomas Seburn, Earl Flynn and Edward Mogren.

President Gove reported that a schedule for subsequent meetings was as follows:

March, 1959 in Boston in connection with Massachusetts Safety Council meeting.

April, 1959 in Worcester, Massachusetts

May, 1959 Annual Meeting in Sturbridge, Massachusetts

President Gove then reported the intent of Boston area members to conduct some local meetings in addition to the regular section meetings. This report engendered considerable discussion of the significance of this intention and of the possibility that it might eventually lead to formation of a Boston area section. The discussion brought forth several suggestions which might improve attendance and interest in section meetings. Earl Flynn suggested that meetings beginning early in the afternoon would permit more time for field trips and other technical matters. Charles Pratt suggested local luncheon meetings were convenient and desirable to the membership in addition to section meetings. Herbert Levinson suggested more section meetings possibly on a monthly basis. Roger Chandler brought out the fact that time and distance is a problem for attendance at additional section meetings. Mathew Huber brought out the fact that diversification of meeting locations in recent years has been better than in the past. Fred Hurd suggested that no action or reaction to the Boston area intentions be made at this time until clarification becomes available. President Gove closed the discussion on this note with a promise for further discussion at the next section meeting.

The Program Chairman, Robert Williston, introduced Lennart Kloo of the Connecticut State Highway Department and Charles Hughes, Traffic Engineer of the City of Hartford, Connecticut, for presentation of planned traffic operations during the construction of Morgon Street interchange in Hartford, Connecticut.

The two gentlemen described in detail the several construction stages and planned traffic operations to be conducted during construction period of the interchange. Their discussion showed the manner which they planned to use both temporary roadways and permanent roadways as they became available by the routing of traffic around and through the section areas. Mr. Hughes described one-way control of operations and other controls to be utilized for the guidance of traffic during the construction period.

TEXAS SECTION

Austin Area

Bim Greer has been busy cracking the whip in the Traffic Engineering Section trying to get out a (65 sheets) sample set of

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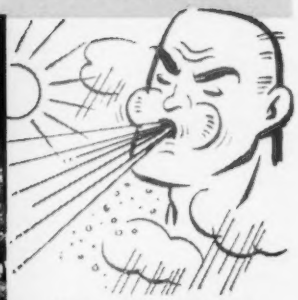

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signing plans for the Interstate System as well as the specifications that try to explain the details not covered in the plans. It is reported that one of the boys is exhibiting a doctor's certificate exempting him from using a Leroy set. Nobody cracked the whip while Bim was in Miami Beach getting elected to the ITE Board of Direction.

Bim, Bill and Dick got the First Annual Conference of the Governor's Highway Safety Commission off to a good start in Austin in November. They attended the luncheon at which Walt Klapproth, representing ITE, presented Governor Price Daniel with the 1957 Traffic Engineering Award won by the Highway Department as a part of the National Safety Council contest.

Sam Roper reports the tail end of that whip has been catching him pretty regularly for the last two months, but that the sample signing plans are next to being finished. He also has been getting ready to register y'all at the January meeting.

Bill Welty still hasn't gotten his neckie caught in the computer, despite the fact work is still underway on a program for traffic signal ground wire sizes, wiring diagrams and conduit sizes.

Ed Smith is back with the Department after giving Prof. Keese a bad time for a year.

Dick Oliver is busy packing and trying to sell his home in preparation for his transfer to the Corpus Christi District, January 1. He'll get there in time to carry some of the load in signing and signalizing of the Corpus Expressway. It isn't clear whether the recently completed signalization at the interchange of U. S. 81 and Airport Blvd. in Austin influenced this move or not—he designed (?) it.

Harold Beasley has been busy with plans and more plans on the traffic signal program —vehicle actuated and traffic density stuff, plus left turn deductible features and what not. Harold has become the City's expert tree and shrubbery remover and its most successful salesman in convincing property owners to "cut it down." In addition, he has the responsibility of keeping four blonds, brunettes and a redhead busy with office work. He also has a mandate to complete the installation of 12" lens signal heads along the "Avenue" before Christmas.

During the past four or five months, Walt Klapproth, among other things, has been occupied with roadway design and a 3,000 car parking lot in the Auditorium area; a 400 car parking lot at Brackenridge Hospital; roadway design at the new Airport Terminal building and is now working on the street plan adjacent to the Airport. Then, too, there is the proposed traffic density signal system in the Auditorium area now in design stage.

Houston Area

Harvey Hawkins has been working hard this year and now has almost 125 new signals in operation, making a grand total of about 700 for Houston.

Thomas E. Willier is mighty proud of the Herman Professional Building Garage which is Houston's first garage designed 100% for self parking. It is a split level job providing for 1,000 vehicles and is connected to the Herman Professional Building by a tunnel. The Williers are planning a combination business/pleasure trip to Mexico City and Acapulco.

It has been reported that some of our "good taxpaying citizens" have been calling Dale D. Marvel during the "wee" hours of the morning to complain about highway traffic signal installations in District 12. (Look out, Gregg, when Dale comes to Waco.)

San Antonio Area

Carl Braunig reports that the Highway Department is starting its first interchange signalization program in San Antonio. This project consists of installing signals at four intersections on the fringe of downtown. The control equipment will be PR and will be connected to the downtown system. The contractor is the Traffic Controls Company of Houston. Carl also reports he is very busy with the interstate signing program and is in the process of installing overhead signs at a major interchange in San Antonio.

Stew Fischer has finally gotten into step and got a minimum speed established on the expressway. He is now worried if enough SA people visit northward, he may also have his through traffic keeping left except to pass on exit. Studies are being made to find an answer to a section of expressway on which there is a 1975 demand for 14 lanes. Anyone with answers to a 14-lane expressway, contact Stew.

Dick Conley reports merely that he is alive. He has been kept busy riding herd on the various improvement projects going in San Antonio.

El Paso Area

El Paso's O & D study is progressing very well under the able supervision of Joe Wright. Joe says the internal and external interviewing is complete and that only a few truck and taxicab interviews remain to be taken. Punching and verifying are underway and Joe expects to finish by mid-February.

Rick Bustamante, El Paso's Assistant Traffic Engineer, has been elected to membership in the Institute. Rick and Joe Nadon attended a meeting in Albuquerque of the Arizona-New Mexico Division of the Western Section.

Joe Nadon spent a "Busman's Holiday" over Thanksgiving in Phoenix, going over some of their problems wtih Chuck Haley. Chuck is still looking for an Assistant Traffic Engineer.

Joe's plans for the June TexITE meeting in El Paso are slowly forming. Be sure to make plans to be in El Paso for that meeting.

Wichita Falls Area

Earl Williams has just completed installation of three 1022's and two 505's. They have recently opened the first segment of the Red River Valley Expressway. It is a 1.9 mile Expressway costing better than $4 million.

College Station Area

A conference on "The Planning and Design of Streets and Highways in Cities" was held on November 19-20 at the Memorial Student Center on the Texas A & M College campus. The conference was sponsored jointly by the Texas Transportation Institute and the Civil Engineering Department of A & M College, and in cooperation with the joint committee of Texas Highway Department and League of Texas Municipalities on Median Practices on Highway Routes on city streets. The program was presented by representatives of various cities, the Highway Department, Bureau of Public Roads and A & M College. A number of Texas section members participated in this meeting, both as "speakers" and "listeners."

A meeting of the Project Advisory Committee, Research Projects on Ramps and Interchanges was held at Texas A & M College on November 19. Several Texas Section members are on this committee.

Project Advisory Committee, Research Project on Speed Zoning was held at Texas A & M College on October 31, with a number of Texas Section members in attendance.

Fort Worth-Dallas Area

Members in this area are concentrating in their spare time on preparing a list for invitations to the Freeway Operations Seminar to be held at the Western Hills Inn on Hwy. 183 between Fort Worth and Dallas, February 2, 3 and 4. We hope to see a large number of members attending the annual meeting proceed on to Fort Worth for this Seminar.

The Texas Section was well represented at the National Meeting in Miami. At the last count, there were fourteen Texas members present.

Canadian Section

Officers elected at the annual meeting of the Canadian Section for 1959 are as follows:

President—A. H. Lomax, Deputy Director, Traffic Engineering Department, Hamilton, Ontario.

Vice-President—W. F. Finnbogason, Traffic Engineer, Winnipeg, Manitoba.

Secretary-Treasurer—G. A. Bacchus, Assistant Traffic Engineer, Metropolitan Toronto Planning Board, Toronto, Ontario.

Eastern Director—J. Barriere, Assistant Director Traffic Department, Montreal, Quebec.

Central Director—A. J. Freedman, Municipal Studies Engineer, Planning Branch, Department of Highways of Ontario, Toronto, Ontario.

Western Director—D. D. Kuchinski, Traffic Safety Engineer, Alberta Department of Highways, Edmonton, Alberta.

Past President—S. Cass, Traffic Engineer, Municipality of Metropolitan Toronto, Toronto, Ontario.

WESTERN SECTION

Inter-Mountain Area

A two-year Metropolitan Transportation Study is being undertaken in the Denver Area. Engineers and technicians from the Colorado Department of Highways, the Inter-county Planning Commission, the City of Denver, and representatives of the surrounding counties of Adams, Arapahoe, Boulder and Jefferson, and engineers from the U. S. Bureau of Public Roads are cooperating in this venture.

Arthur Carter from the office of O. K. Norman spent three days with several of the local engineers discussing the steps to be followed in the determination of street capacities and inventories.

Ed Marple of the Bureau then concentrated on indoctrination for the origin and destination study, and met with administrators of the various City and County governments on December 15th to explain the operation to them. A policy committee has been formed consisting of Bob Livingston from the Colorado Department of Highways, Jim Mueller from the Bureau of Public Roads, George Nex for the City of Denver. In addition to this, there will be a representative from the inter-regional planning group, and one member representing the municipalities.

Kenneth Mick of the Colorado Department of Highways has been appointed the Study Director. He will be assisted by various members of the Department, and Jim Small will be the coordinator for the City and County of Denver, assisted by Eugene VanCamp of the City Engineer's Office, and Lou Kisseleff from the Traffic Engineering office.

Downtown Denver may soon see a complete rebuilding of its street lighting facilities. A major effort has been undertaken by the Downtown Improvement Association to form an improvement district or a voluntary contribution program and completely modernize lighting in the entire downtown

Central Business District. The total estimated equipment cost for this project would be approximately $350,000, and would raise the light level to a point ten times that which now exists.

Congratulations are in order in the Denver Area for John Burg, Jim Brown, Gus Byrom, and Vealess Hudspeth, who have all advanced to the grade of Associate in the Institute.

The Colorado Department of Highways will call for bids on two more Interstate signing jobs within the next 30 days. These two signing contracts prepared by the Traffic Operation Section include the Idaho Springs Bypass west of Denver, and 6.5 miles on Interstate Route 80S north of Denver.

Arizona-New Mexico Area

The highlight of traffic engineering activities this past month was an Area meeting held in Albuquerque on December 6th. The coordination of the program and all arrangements were handled by Francis Burton, Albuquerque Traffic Engineer. Francis did a fine job, and his efforts were appreciated by all 26 in attendance. The cities of Las Cruces, Farmington, Lubbock, Phoenix, and Albuquerque; the states of Arizona and New Mexico; and the Automotive Safety Foundation were represented at this meeting.

The use of construction sign manuals was discussed. As an additional comment on this, the Traffic Engineering Division of the Arizona Highway Department expects to publish a construction sign manual shortly after the first of the year. This sign manual will be available on request, and the only payment expected is constructive criticism by the receiving party. Considerable time was devoted to discussing location and spacing of driveways, location and painting of school zones, and methods of obtaining railroad crossing signalization. In addition, other items discussed were house moving practices and handling of overload vehicles, restricting development on land areas where right of way for future road construction will be needed, procedures necessary to pave city streets, and interstate signing procedures.

For the past two months, Phoenix has had an extensive painting program in anticipation of the heavy winter traffic volumes. Chuck Haley has just completed signing for the annexed areas taken into the City last April. He will probably have a few months rest before wading into another annexation program which may involve close to 50 additional square miles and a population increase of over 100,000 people.

The Traffic Engineering Division of the City of Phoenix was awarded a Certificate of Merit from the National Safety Council for outstanding achievement in Traffic Engineering. This award was presented to the City at the Annual Inventory Luncheon by Robert Hopper, West Coast Representative of the National Safety Council from Denver, Colorado.

Nowadays it is difficult to talk to Chuck Haley on the telephone because of the noise of hammers and saws in his office. His office expansion and remodeling program is finally underway. This will provide much needed space for accelerated Traffic Engineering operations of the City.

The new Mule Pass Tunnel has been completed on US Highway 80 near Bisbee. This tunnel is approximately one quarter mile long and cost approximately $2,000,000 of the total project cost of $5,000,000. The remaining money is to be used in re-alignment and reconstruction of Highway 80 to eliminate travel between Mule Canyon and Brewery Gulch. The Traffic Engineering Division has been responsible for illumination of the tunnel, geometric design and painting of the roadway. High-output fluorescent tube lighting is being used in the tunnel. The sunlight is extremely bright here in Arizona, and design of lighting for tunnels is especially critical to insure that the contrast in light from daylight to inside the tunnel is not too great. In addition, the walls of the tunnel have been painted with a highly reflective vinyl white paint. The value of this paint and the effectiveness of the lighting are still in the process of experimentation.

For the interest of tourists coming to Arizona from the north through Utah on US 89, a new section of roadway will be opened up sometime in January. This road will proceed from Kanab, Utah, to the Glen Canyon Dam and across the Colorado River at that point. Proceeding on south, Arizona State Route 189 will bring traffic back into US 89. This will enable visitors to Arizona to have a look-see at the Glen Canyon Dam and the Grand Canyon all in one trip. It is hoped that this will spur activity to visit sunny Arizona.

San Diego Area

The November Dinner-Workshop held in the San Diego Hotel was acclaimed by most who attended as being a success. The topic for the evening was "Guide Signing." It was generally cussed, discussed and thoroughly kicked around. The writer still wonders how, when, and where to use green backgrounds though. (You're not alone!—Ed.) The highlight of the evening was the presence of Skinny DeYoung, fresh from the Miami Convention with details for the not-so-fortunate.

A hearty welcome to Bill Calland, California Division of Highways, San Diego Area, who joins us as an Associate Member of ITE. Congratulations also are in order for Bill on his appointment to Construction Engineer in District XI.

Paul Fowler of the County has now experienced having one of his new aluminum signal and lighting standards knocked down. Paul has reset the original pole and is satisfied that it can take quite a jolt.

Oregon Area

Fred Fowler recently returned from a trip to Boston where he attended the American Municipal Association meeting held November 30th through December 3rd. Fred is a member of the Highway Committee for the Association. On his return trip, Fred visited Washington, D. C., and also Cincinnati where he reminisced with George Howie and inspected some of the highway work being done in the area.

The City of Portland, again this year, is prohibiting some of the turning movements in the downtown area during heavy shopping hours. These "No Turns" eliminate the congestion created by heavy turning through heavy pedestrian volumes.

An interesting "before" and "after" traffic volume study has been made on S.E. Grand Avenue and S.E. Union Avenue in Portland. As two-way, four-lane streets, their combined ADT was 27,000 vehicles. Now as a one-way couplet (four lanes each direction), their combined ADT totals 47,000. Much of this traffic is generated by the Banfield Freeway which interchanges traffic with this couplet. This freeway was opened in the interim between these counts.

INDIANA & MICHIGAN SECTIONS

Potowatomi Report

This year the early arrivals on Friday, September 19, were much the same as last year. Eager beavers to first check in were the Michigan Malos and Ronans, Indiana's Ted Siegels, Neffs, and Frank Vukovits; and Ohio Musicks, Robinettes, Woodlings, Cy Clark, the Bartons, Bob Holadays, and the heavily laden truck driving Joe Burger. Total attendance figures by Saturday night, however, stood as follows:

Indiana	— 23
Michigan	— 18
Ohio	— 31
Ontario	— 0

We were all pleased to see such a fine turnout from Indiana, almost double over last year. It looks like both the Indiana and Ohio Sections will have to team up to pressure Michigan into increasing their participation next year. After all, there are more members in Michigan than in Ohio and Indiana combined yet their turnout was only 18 as compared to 54 from Ohio and Indiana.

One of the most popular features of the "headquarters" cabin was the "Burger Special Machine." It consisted of a fast electronic heating cabinet fully equipped with an inexhaustible supply of frozen hotdogs, hamburgers, cheese sandwiches, polish sausage creations and a continuous line of untiring attendants headed by Joe Burger. Really, a job well done by our Refreshments Committee to whom we owe a real vote of thanks.

The Ladies Committee also contributed handsomely to the success of the week-end. The Special Choral group arranged for by Mrs. Eckhard turned out to be a wonderful treat. Their renditions of many songs held all of us virtually spellbound Saturday night. Too bad someone didn't think of bringing a tape recorder along. Bridge prizes donated to the Ladies Committee did double duty. Enough were left over after card games to be given away to lucky ticket holders after dinner Saturday night.

A colorful highlight followed the choral group. The Ronans showed color slides of Paris, London, and other cities abroad. A most interesting treat with excellent photography and composition.

Sport shirts flourished throughout the entire week-end. The most unusual shirt, a creation by Mrs. Woodling won for Herb the honor of "Best and Most Original Shirt."

Then there was an ambitious crew that tried to make a buck without the benefit of license or investment. One evening after dinner when we all returned to our cabins we found that all of the many autos had "For Sale" signs attached to them. I guess all this crew really intended to make is very little more than a "buck" because the auto prices ranged from ten cents to twenty-five cents each.

At 5:00 P.M. Saturday a District #3 business meeting was held. Herb Woodling started off with a report on Ohio Sections annual meeting which this year had special emphasis on Legislative Committee work being well handled by our able Paul Robinette. Other projects the Ohio Section is active in are: More Emphasis on Uniformity in Traffic Control Devices, Traffic Engineering Aid to Smaller Communities, and Making a Worthy Contribution to Strengthen the I.T.E. Technical Council.

Miami Report

Our District #3 came up with a great representation at Miami. Although the District contains only *12%* of the total *I.T.E. membership* we turned out *20%* of all the males and *18%* of all the females registered at the Miami annual meeting.

METROPOLITAN (N.Y.) SECTION

Minutes of December 16, 1958 Meeting

The meeting was called to order by President Arnold Fisch at 7:50 P.M. at the Port Authority Building in New York City. Fifty three members and guests were present.

Ed Ricker was recommended by the Advisory Board as nominee for Director of District 1 in the forthcoming ITE elections. The Section members present at the meeting endorsed the nomination.

Gordon Gravelle announced that tentative plans call for the local Freeway Seminar to be held at the Bear Mountain Inn on May 11, 12 and 13.

George Wickstrom reported that three new members had been added to the Met Section roster.

Gordon Gravelle introduced the speakers of the evening—Edward S. Olcott, Joseph Fabian and Richard Strickland, all of the Port of New York Authority. The topic was the "Second Decking of the George Washington Bridge."

Ted Olcott explained the background of the second deck project. He told of the feasibility studies made as part of the 1953-54 Joint Study which included other arterial projects in the metropolitan area. The plan is designed to facilitate the bypassing of Manhattan.

Traffic on the George Washington Bridge has grown from 8.3 million in 1945 to 35.8 million in 1957. Peak periods considered in the design were Sunday evening eastbound, weekday morning eastbound, and weekday evening westbound. Seventy two per cent of the traffic in the peak period on Sunday wish to bypass Manhattan compared with 55% on weekdays.

The second deck will have six lanes and will increase the capacity of the bridge to 56 million. Capacity is expected to be reached by 1972.

New approach systems are being designed on both sides of the bridge. A new 12 lane expressway will be built across Manhattan (including a new bus terminal) connecting with the Cross Bronx Expressway via the new highlevel Alexander Hamilton Bridge over the Harlem River. On the New Jersey side new approaches are being built connecting with all routes in the area including the new Bergen Expressway.

Joseph Fabian explained the stage construction procedure for the improved connections to the Henry Hudson Parkway and the expressway across Manhattan through the use of an expertly designed model.

Dick Strickland explained the operation of the new facilities. The signing will be in conformance with interstate standards with some multiple message signs. He explained the flexibility in the use of the two decks whereby one can be closed for maintenance or during periods of light traffic.

A short question and answer period followed the talks. The meeting was adjourned at 9:20 P.M.

New Institute Members

The following eight local men have been accepted as junior members of the national ITE according to the latest listing: Robert Breuer, Hans Nintzel, George Marshall, and Don Weisstuch (All of the N.Y.C. Department of Traffic), John Cade (N.J. Bureau of Traffic Safety), William Gerstle and Leon Goodman (Both of the Port of New York Authority) and Vincent Cassera (City of New Brunswick). Most of these new members have attended recent Met Section meetings.

Low Fatality Rate

The Thruway Authority has announced that its fatality rate for 1958 was 0.88 per hundred million vehicle miles, less than half the 1957 rate. There were 17 deaths during 1958 but not one multiple-death accident. Some of the reasons for the improved record include the installation of guide railings around bridge piers and the increased use of reflective striping.

Member News

Secretary Warren Travers has recently been admitted to the firm of Edwards and Kelcey, as an Associate.

Narrows Bridge

The last obstacle in the path of the construction of the Narrows Bridge was hurdled on December 30, 1958 when the New York City Board of Estimate voted 20-2 to approve the route of the Brooklyn approaches to the bridge. The suspension span is now scheduled for completion in 1964.

Part-Time Teachers

Ernie Boulding, Traffic Engineer for Bergen County, Herb Klar and Steve Petersen, both of whom are with the N. J. Bureau of Traffic Safety are presently teaching the 3rd Program in Street and Highway Traffic and Planning Control of the University Extension Division of Rutgers University. This program takes 2 years and consists of 24 credits culminating in a certificate. This program is for persons engaged in traffic control and planning and is designed to assist local communities and counties in New Jersey with their traffic problems by providing training in many of the fundamental principles of traffic engineering and related subjects. The present class consists of 22 students.

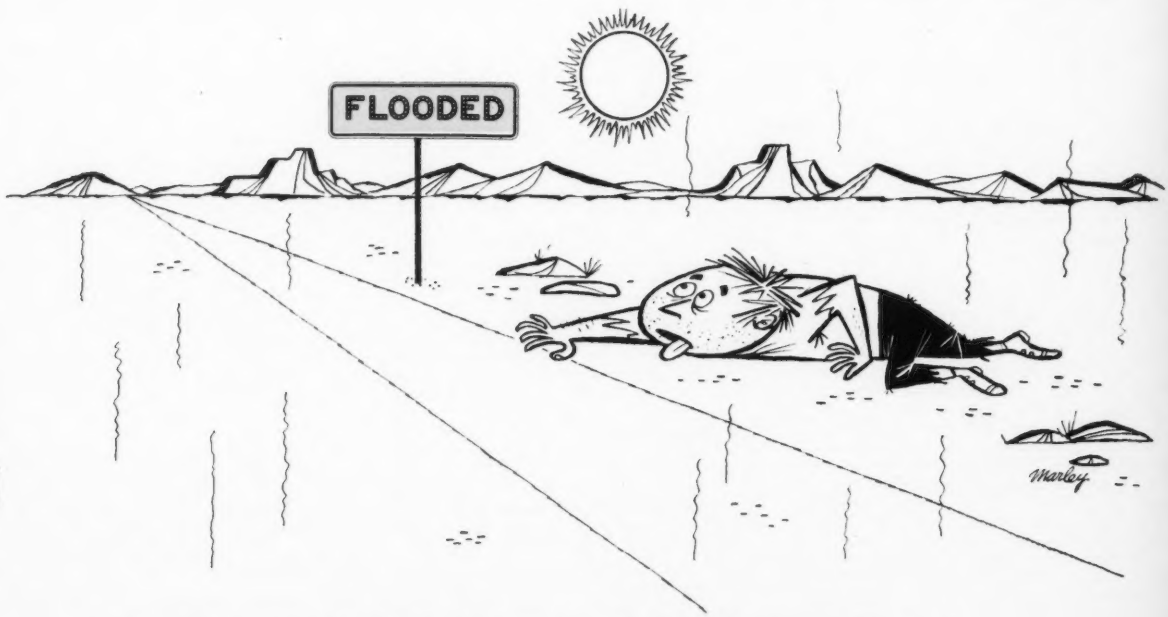
Legislative Committee

Herb Klar has recently been appointed Chairman of the Legislative Committee of Mercer County Chapter of New Jersey Society of Professional Engineers.

1959 *ANNUAL MEETING*

The Executive Committee for the 1959 Annual Meeting includes Warren Quimby as Chairman, Arnold Fisch, Tom Fratar, Gordon Gravelle, and Ed Wetzel.

Chairmen of the local arrangement subcommittees are as follows:
Hotel Arrangements—Lou Bender
Registration—Larry Lawton
Publicity—Charles Murphy
Entertainment—Jack Leonard
Session Arrangements—Ed Ricker
Special Services—Bob Roy
Finance—Dwight Myers



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APPLICATIONS FOR TRANSFER

(Continued from page 42)

CROSBY, John R.
Assistant Traffic Engineer, New Jersey Turnpike Authrity, New Brunswick, New Jersey. December 19, 1958 for ASSOCIATE grade.

KYRK, Dennis D.
Assistant Director, Office of Traffic Control, 501 City Hall, Oklahoma City, Oklahoma. December 22, 1958 for ASSOCIATE grade.

NEW APPLICATIONS

CLAFFEY, Paul J.
Associate Professor, Civil Engineering, Catholic University, and Supervisory Highway Research Engineer, U.S. Bureau of Public Roads, Washington 25, D.C. December 10, 1958 for ASSOCIATE grade.

FRERICH, William R.
Highway Engineer, Department of the Army, Office of the Chief of Transportation, Washington 25, D.C. January 7, 1959 for ASSOCIATE grade.

HARDJODIPURO, Suwarto
Traffic Engineer, Department of Public Works, City, Djakarta, Indonesia. December 22, 1958 for JUNIOR grade.

HIGGS, Robert W.
Traffic & Photogrammetric Engineer, Federal Department of Public Works, Hunter Building, Ottawa, Ontario, Canada. December 24, 1958 for JUNIOR grade.

IRBY, Howard E.
Associate Professor of Civil Engineering, University of Missouri, Columbia, Missouri. December 12, 1958 for ASSOCIATE grade.

MALONE, Raymond J.
Assistant Highway Analyst, N. J. State Highway Department, 1025 Parkway Avenue, Trenton, New Jersey. January 8, 1959 for ASSOCIATE grade.

NAWATA, Akira
Traffic Engineer, Stanley, Grimble, Roblin Ltd., 8908 99th Street, Edmonton, Alberta, Canada. December 12, 1958 for JUNIOR grade.

PERRY, Clyde H.
Engineer, General, Department of the Army, Office of the Chief of Transportation, Washington 25, D.C. January 7, 1959 for ASSOCIATE grade.

SCHEINESON, Julian
Traffic Control Engineer, Department of Public Utilities, 417 Lincoln Park Drive, Cincinnati, Ohio. December 24, 1958 for ASSOCIATE grade.

SCHMELZKOPF, Philip C.
Traffic Engineering Assistant, Traffic Engineering Department, City, 501 City-County Building, Madison 9, Wisconsin. December 29, 1958 for ASSOCIATE grade.

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